

Sediment Characterization Sampling and Analysis Results
(SAR) for the Levin-Richmond Terminal Corporation
Berth A

Maintenance Dredging Program

Episode 1

Prepared for

Levin-Richmond Terminal Corporation
402 Wright Avenue
Richmond, CA 94804

Prepared by

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534

January 2009



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Ms. Debra O'Leary
U.S. Army Corps of Engineers
San Francisco District
1455 Market Street
San Francisco, CA 94103-1398

January 24, 2009

Dear Ms. O'Leary:

On behalf of Mr. Jim Cannon of the Levin-Richmond Terminal Corporation (LRTC), please find enclosed three (3) copies of the report "Sediment Characterization Sampling and Analysis Results (SAR) for the Levin-Richmond Terminal Corporation Berth A" in support of the shipyard's maintenance dredging program. In addition, one copy of this SAR has been sent to the other DMMO participating agency representatives. This SAR has been prepared to support dredging of approximately 5,200 cubic yards of material from LRTC's Berth A.

LRTC, located in Point Richmond (CA) in the Richmond Inner Harbor Channel, is currently seeking 10-year permits/certification from the U.S. Army Corps of Engineers (USACE), the Bay Conservation and Development Commission (BCDC) and San Francisco Bay Regional Water Quality Control Board (RWQCB) for maintenance dredging of their Berth A.

The results of this testing indicated elevated levels of both DDT and PCB in the LRTC Berth A sediments prohibiting in-bay disposal of these sediments. Previous testing performed on LRTC Berth A sediments indicated that the sediments were suitable for disposal at the Montezuma Wetlands Project (Montezuma). These sediments have DDT concentrations similar to those previously disposed at Montezuma and LRTC is currently evaluating the feasibility of disposing of this material at Montezuma or other appropriate disposal site.

If you have any questions, please give me a call at (707) 207-7761. I look forward to hearing from you.

Sincerely,

Jeffrey Cotsifas

President

cc (w/enc): Brian Ross, U.S. EPA
Brenda Goeden, BCDC
Beth Christian, SFRWQCB
George Isaac, CDFG
David Woodbury, NMFS
Donn Oetzel, SLC
Jim Cannon, LRTC

CORPORATE HEADQUARTERS
2250 Cordelia Road
Fairfield, CA 94534
phone : 707.207.7760
fax : 707.207.7916

CENTRAL VALLEY
6820 Pacific Avenue, Ste. 3D
Stockton, CA 95207
phone : 209.952.1180
fax : 209.952.1180

SOUTHERN CALIFORNIA
2792 W. Loker Avenue, Ste. 100
Carlsbad, CA 92010
phone : 760.602.7919
fax : 760.602.9119

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List of Acronyms

ASTM	American Society for Testing and Materials
Bay	San Francisco Bay
BCDC	Bay Conservation and Development Commission
COC	Chain-of-custody
CV	Coefficient of Variation
DGPS	Differential Global Positioning System
DMMO	Dredged Material Management Office
EMI	EnviroMatrix, Inc.
GPS	Global Positioning System
ITM	Inland Testing Manual (USEPA/USACE 1998)
LRTC	Levin-Richmond Terminal Corporation
LTMS	Long Term Management Strategy
MLLW	Mean lower low water
PER	Pacific EcoRisk
QA/QC	Quality assurance/quality Lab Control
RSD	Relative Standard Deviation
RWQCB	Regional Water Quality Lab Control Board
SAP	Sampling and analysis plan
SLC	State Lands Commission
SOP	Standard operating procedures
TEG	TEG Oceanographic Services
TOC	Total Organic Carbon
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

Distribution List

O'Leary, Debra (3 bound copies)
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, CA 94103-1398
Phone: (415) 503-6807
Email: Debra.A.O'Leary@usace.army.mil

Ross, Brian
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105-3919
Phone: (415) 972-3475
Email: Ross.Brian@epamail.epa.gov

Goeden, Brenda
San Francisco Bay Conservation and Development Commission
50 California St., Suite 2600
San Francisco, CA 94111-6080
Phone: (415) 352-3623
Email: brendag@bcdcc.ca.gov

Christian, Beth
San Francisco Regional Water Quality Control Board
1515 Clay St., Suite 1400
Oakland, CA 94612-1413
Phone: (510) 622-2335
Email: echristian@waterboards.ca.gov

Isaac, George
California Department of Fish & Game
20 Lower Ragsdale Drive, Suite 100
Monterey, CA 93940
Phone: (831) 649-2813
Email: gisaac@dfg.ca.gov

Woodbury, David
National Marine Fisheries Service, Southwest Region
777 Sonoma Ave. #325
Santa Rosa, CA 95404
Phone: (707) 575-6088
Email: David.P.Woodbury@noaa.gov

Oetzel, Donn
State Lands Commission
100 Howe Ave, #100 South
Sacramento, CA 95825-8202
Phone: (916) 574-1998
Email: OetzelD@slc.ca.gov

Cannon, Jim
Levin-Richmond Terminal Corporation
402 Wright Avenue
Richmond, CA 94804
Phone: (510)-307-4020
jimc@levinterminal.com

1. INTRODUCTION

The Levin-Richmond Terminal Corporation (LRTC), located in Richmond, CA, in the Richmond Inner Harbor Channel (Figures 1-1 through 1-3), is currently seeking 10-year permits/certification from the U.S. Army Corps of Engineers (USACE), the Bay Conservation and Development Commission (BCDC) and San Francisco Bay Regional Water Quality Control Board (SFRWQCB) for maintenance dredging of their Berth A. LRTC has contracted Pacific EcoRisk to perform sampling and testing of its Berth A sediments in support of the first maintenance dredging episode under the new permits.

As specified in the previously-approved Sampling and Analysis Plan (SAP), samples were collected within the LRTC Berth A area to a total depth of -41.5 MLLW (Table 1-1) for chemical analysis of sediments for disposal at an appropriate disposal site. As per DMMO request, each of the sediments core sediments to a depth of -41.0 MLLW was analyzed individually for the full suite of analytical chemistry as per ITM and USACE PN 01-01; as per the DMMO request, a "z" layer was also collected from the -41.0 to -41.5 ft MLLW horizon and analyzed to assess the expected sediment quality that would be present at the post-dredge sediment surface.

This data report presents the analytical chemistry results required for determining the suitability of sediments for disposal at an appropriate disposal site. The proposed maintenance depth, including over-depth, and the current estimated volumes of material to be dredged are summarized in Table 1-1.

Table 1-1. Proposed maintenance dredging for the Levin-Richmond Terminal Corporation

Area	Permitted Depth (ft MLLW)	Estimated Volume (yds ³)	Over-depth (ft)	Estimated Volume (yds ³)	Overall Depth (ft MLLW)	Total Estimated Volume (yds ³)
Berth A	-39.0	1,780	2.5	3,346	-41.5	5,126

1.1 Objectives of the Sediment Investigation

The purpose of this investigation was to evaluate the proposed dredged material to determine whether it will represent an adverse impact during removal operations and placement at an appropriate disposal site. The procedures for sediment sample collection, sample processing and preparation, and physical and chemical analyses, and data analyses were presented in the previously submitted and approved Sampling and Analysis Plan (SAP). The specific objectives of the SAP scope-of-work were as follows:

- Collect core samples from within the designated sampling areas following field protocol detailed in the SAP;
- Conduct chemical analysis to determine whether sediments are suitable for unconfined aquatic disposal (SUAD); if sediments are not SUAD, determine if sediments are suitable for an alternative disposal site (i.e., Montezuma Wetlands Project [Montezuma]). Results of chemical analysis were compared to reported San Francisco Bay sediment background concentrations (SFRWQCB, 1998).

1.2 Organization of this Document

Sample collection and handling procedures are discussed in Sections 2 and 3. The results of the physical/chemical analyses are provided in Section 4. Section 5 presents the conclusions, and references are provided in Section 6. Appendices A-C contain supporting documentation for this study.



Figure 1-1. Location map: Levin-Richmond Terminal

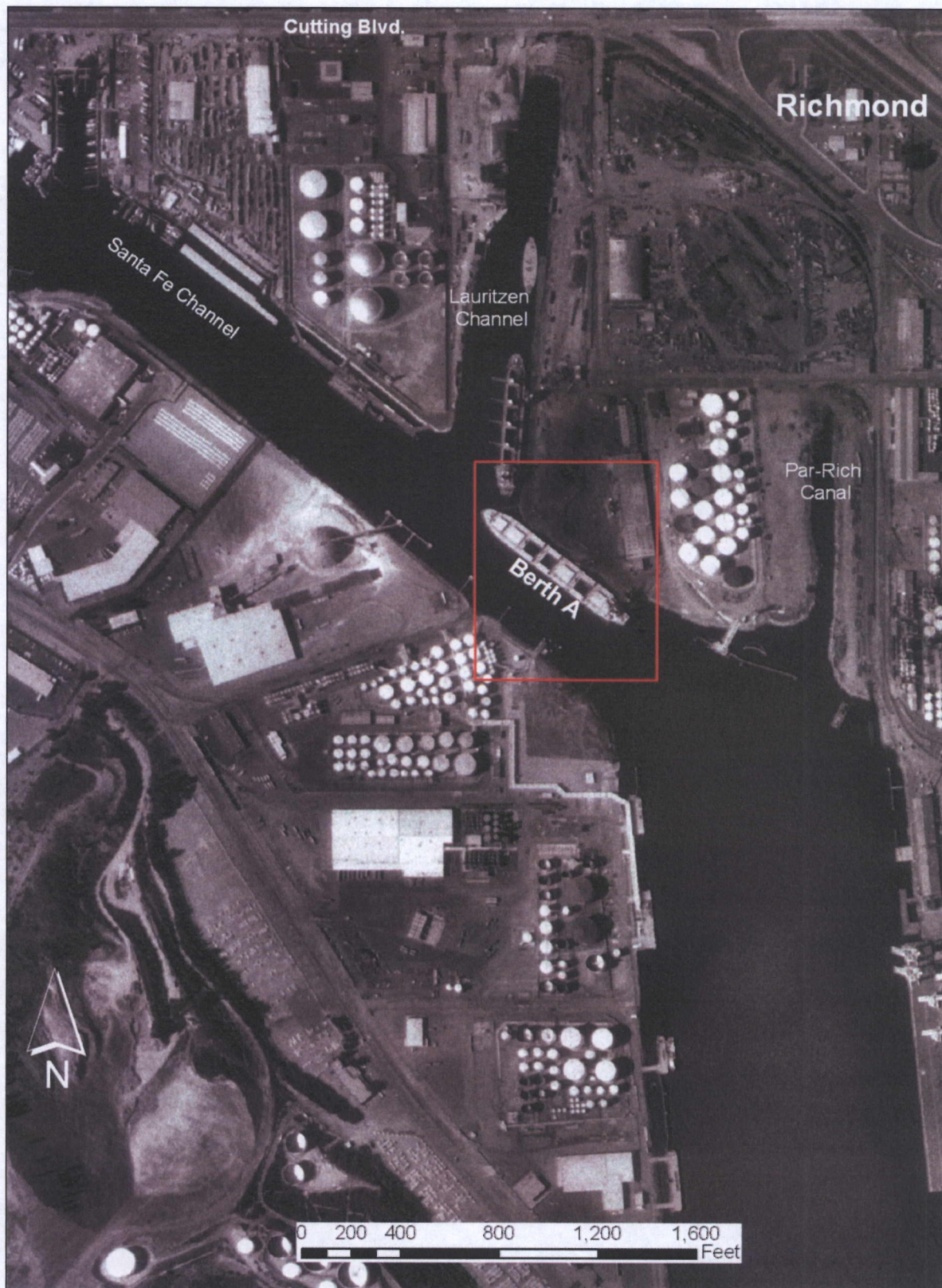


Figure 1-2. Vicinity Map #1: Levin-Richmond Terminal

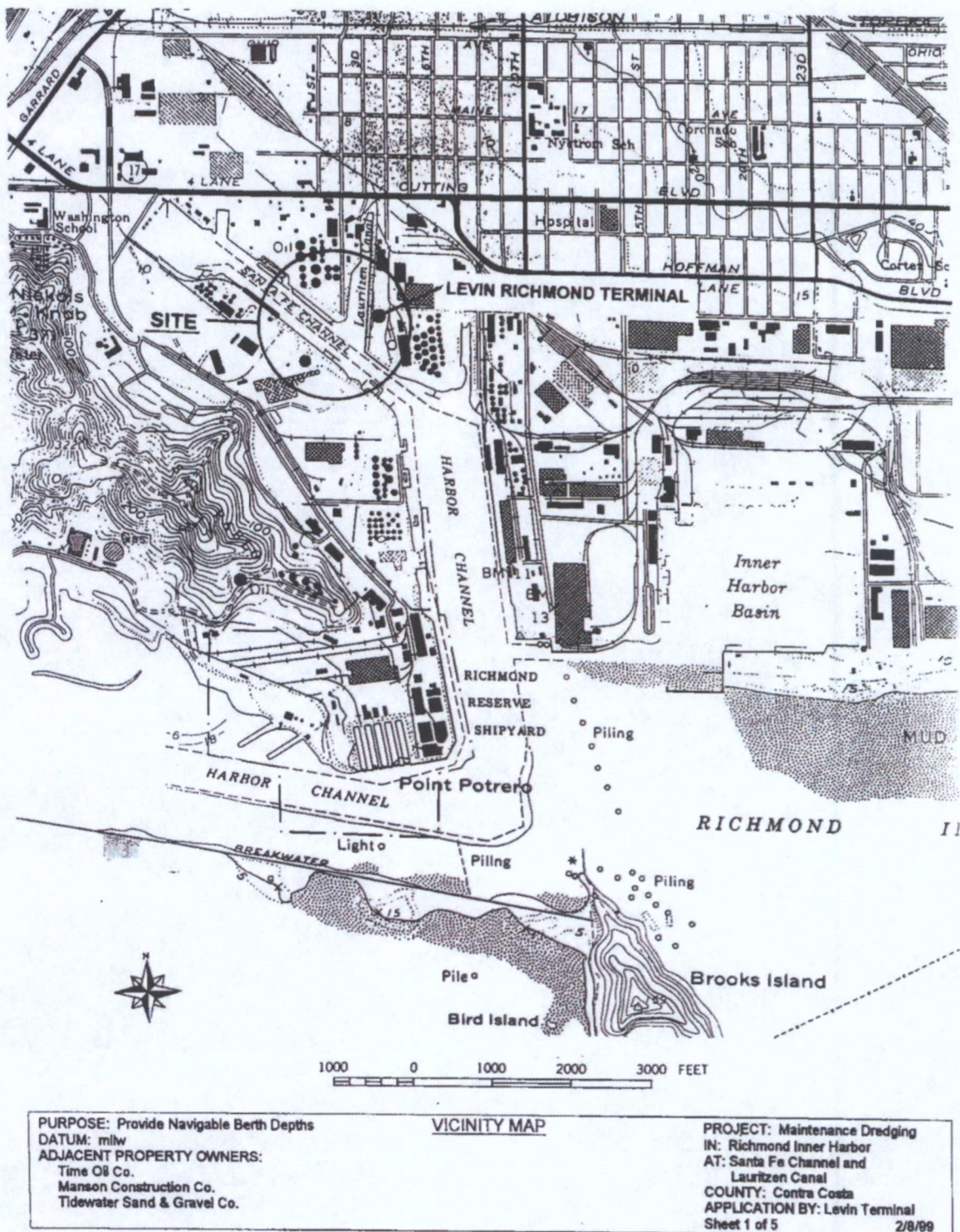


Figure 1-3. Vicinity Map #2: Levin-Richmond Terminal

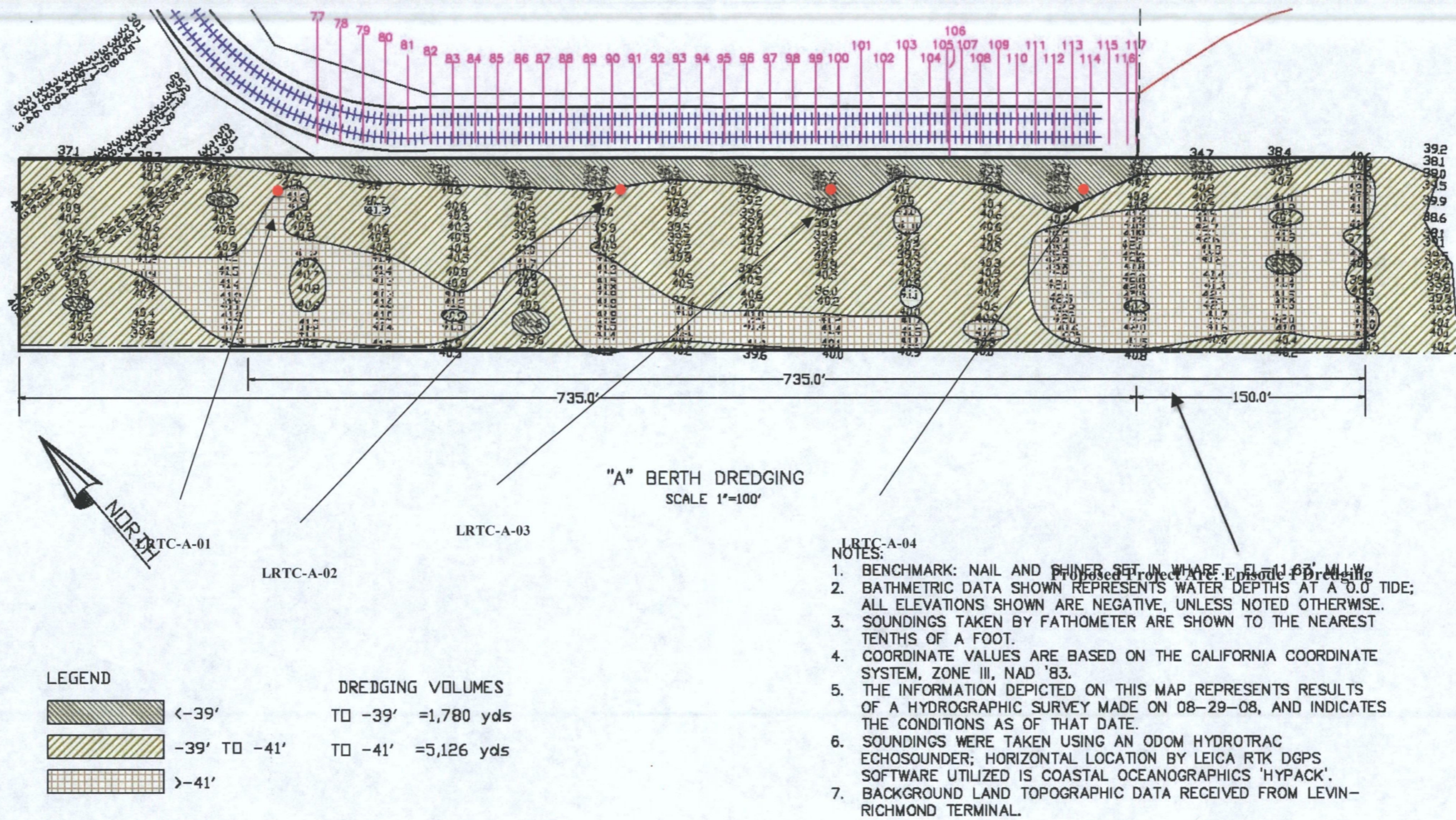


Figure 1-4. Levin-Richmond Terminal Berth "A" Sample Locations

2. FIELD SEDIMENT SAMPLE COLLECTION

All sediments were collected in accordance with guidelines and procedures outlined in the SAP (PER 2008). All sediment sampling field activities were performed on December 1, 2008, under the direction of Mr. Jeffrey Cotsifas of Pacific EcoRisk (PER). Mr. Mark Mertz of TEG Oceanographic Services (TEG) provided the sampling vessel; PER provided the on-board positioning system and some of the sampling equipment. PER also provided additional Field Scientists to assist in sediment core collection. Four sediment cores were collected from the LRTC Berth A area (Figure 1-4); final site positions were determined with a differential global positioning system (GPS) and are accurate to ± 3 m. Table 2-1 lists station identifiers, GPS coordinates for all core locations, mudline elevations, and core penetration depths for all stations; sample locations are presented in Figure 1-4.

Table 2-1. Locations of sampling stations, core penetration depths

Sample ID	Latitude (N)	Longitude (W)	Mudline Elevation (ft MLLW)	Core Penetration Depth (ft)	Cored Depth (ft MLLW)
LRT-S01-01	37°55'01.4"	122°22'01.1"	37.5	4.5	-41.5
LRT-S01-02	37°55'09.0"	122°21'58.7"	34.9	6.6	-41.5
LRT-S01-03	37°55'08.5"	122°21'57.6"	37.2	4.3	-41.5
LRT-S01-04	37°55'07.6"	122°21'56.5"	34.2	7.3	-41.5

*State Plane Coordinate System, California Zone 3, NAD 83

All sediment samples were maintained on ice until transported to the PER testing lab for processing. Upon receipt at PER, all samples were logged in and placed in cold storage at $\leq 4^{\circ}\text{C}$ in the dark until needed. Field log sheets are presented in Appendix A. There were no unusual circumstances encountered during the fieldwork and no major deviations from the SAP (PER 2008).

3. SAMPLE PROCESSING

Sediment cores were collected from the mud-line to -41.5 ft MLLW. The sediment materials from each core location representing the material from the sediment surface to -41.0 ft MLLW were each individually homogenized within high-density polyethylene buckets to comprise the homogenized core sediments; a sub-sample of each homogenized core sediment was frozen for archival storage. The -41 ft to -41.5 ft MLLW section of each core, designated the Z-layer, were also each individually homogenized within high-density polyethylene bucket to comprise the homogenized core sediments; a sub-sample of each homogenized core sediment was frozen for archival storage. Equal aliquots from each of the homogenized Z-Layer core sediments were composited and homogenized within a high-density polyethylene bucket to comprise the "LRT-A1-Z-Layer Comp" composite sediment. Sub-samples of each of the individual cores samples representing sediments from the mudline to -41.0 ft MLLW and the LRT-S01-Z-Layer Comp were submitted for full chemical and conventional analyses; additional sub-samples of the homogenized composite sediments were frozen for archival storage.

All sediment was processed following procedures outlined in the SAP (PER 2008), with no deviations.

4. RESULTS OF LABORATORY ANALYSES

4.1 Results of Conventional and Chemical Analyses

Sediment samples were analyzed for the chemical and conventional parameters specified in the SAP (PER 2008); all samples were submitted to EnviroMatrix, Inc [EMI] for analysis. Conventional parameters included total organic carbon (TOC), total solids, and grain size; EMI submitted samples to Weston Solutions for grain size analyses. Chemical analyses of trace metals, polycyclic aromatic hydrocarbons (PAHs), chlorinated pesticides, polychlorinated biphenyls (PCBs), and butyltins were also performed. The results of these analyses are summarized in Tables 4-1 through 4-7. The full Data Report for the conventional and chemical analyses that was submitted by EMI is provided in Appendix B.

4.1.1 LRT-S01-01 Analytical Chemistry Results

The "LRT-S01-01" site sediment was 62.7% total solids, and TOC levels were moderate (1.86%). Grain size analyses indicated that the sediment was 35.4% fines (silts and clays), 18.2% sand, and 46.4% gravel.

All of the metal analytes for the LRT-S01-01 sediments were generally similar to the San Francisco Bay background levels (SFRWQCB 1998) with the exception of cadmium, which was 0.68 mg/kg and Lead which was 72.3 mg/kg. Total PAHs were reported at 4350 $\mu\text{g/kg}$ in the sample. With the exception of total DDT, measured at 532 $\mu\text{g/kg}$, and dieldrin, measured at 33.5 $\mu\text{g/kg}$, all organochlorine pesticides concentrations were below their method detection limits. In addition, all organotins and PCB Aroclors concentrations were below their respective method detection limits.

4.1.2 LRT-S01-02 Analytical Chemistry Results

The "LRT-S01-02" site sediment was 60.5% total solids, and TOC levels were moderate (1.39%). Grain size analyses indicated that the sediment was 42% fines (silts and clays), 45.9% sand, and 12.1% gravel.

All of the metal analytes for the LRT-S01-02 sediments were generally similar to the San Francisco Bay background levels (SFRWQCB 1998) with the exception of cadmium, which was 0.80 mg/kg. Total PAHs were reported at 909 $\mu\text{g/kg}$ in the sample. With the exception of total DDT, measured at 55.1 $\mu\text{g/kg}$, and Dieldrin, measured at 2.27 $\mu\text{g/kg}$, all organochlorine pesticides were measured below their method detection limits. All organotin concentrations were below their respective method detection limits. PCB Aroclors were reported at 44.8 $\mu\text{g/kg}$ in the sample.

4.1.3 LRT-S01-03 Analytical Chemistry Results

The “LRT-S01-03” site sediment was 57.2% total solids, and TOC levels were moderate (1.12%). Grain size analyses indicated that the sediment was 38.6% fines (silts and clays), 31.6% sand, and 29.7% gravel.

All of the metal analytes for the LRT-S01-03 sediments were less than the San Francisco Bay background levels (SFRWQCB 1998). Total PAHs were reported at 1410 $\mu\text{g/kg}$ in the sample. All organochlorine pesticide concentrations were below their method detection limits. All organotin concentrations were below their respective method detection limits. PCB Aroclors were initially reported at 5160 $\mu\text{g/kg}$ in the sample; due to this elevated level of Aroclors, this sample was re-extracted and analyzed in duplicate. In addition, an archive sample of the sediment was also tested in duplicate. The results of this testing are summarized in Table 4-5, and indicated that the total PCB aroclor concentration measured in the re-extracted sample ranged from 338-448 $\mu\text{g/kg}$; the results of the archived sample ranged from 203-249 $\mu\text{g/kg}$. The mean concentration of all four analysis suggest that the actual concentration in the LRT-S01-03 sediments is $\sim 310 \mu\text{g/kg}$.

4.1.4 LRT-S01-04 Analytical Chemistry Results

The “LRT-S01-04” site sediment was 37.7% total solids, and TOC levels were moderate (1.64%). Grain size analyses indicated that the sediment was 47.3% fines (silts and clays), 22.4% sand, and 30.3% gravel.

All of the metal analytes for the LRT-S01-04 sediments were generally similar to the San Francisco Bay background levels (SFRWQCB 1998) with the exception of cadmium, which was 1.10 mg/kg. Total PAHs were reported at 396 $\mu\text{g/kg}$ in the sample. With the exception of total DDT, measured at 92.1 $\mu\text{g/kg}$, and Dieldrin, measured at 3.93 $\mu\text{g/kg}$, all organochlorine pesticide concentrations were below their method detection limits. All organotin concentrations were below their respective method detection limits. PCB Aroclors were reported at 66.3 $\mu\text{g/kg}$ in the sample.

4.1.5 LRT-S01-Z-Layer Comp Analytical Chemistry Results

The “LRT-S01-Z-Layer Comp” site sediment was 75% total solids, and TOC levels were moderate-to-low (0.46%). Grain size analyses indicated that the sediment was 72.7% fines (silts and clays), 23.4% sand, and 3.9% gravel.

All of the metal analytes for the LRT-S01- Z-Layer Comp sediments were generally similar to the than San Francisco Bay background levels (SFRWQCB 1998) with the exception of cadmium, which was 0.67 mg/kg and copper which was 93.4 mg/kg. Total PAHs were reported at 405 $\mu\text{g/kg}$ in the sample. With the exception of total DDT, measured at 20.2 $\mu\text{g/kg}$, and Dieldrin, measured at 1.01 $\mu\text{g/kg}$, all organochlorine pesticide concentrations were below their method detection limits. All organotin and PCB Aroclor concentrations were also below their respective method detection limits.

4.1.6 Conventional and Chemical Analytical QA/QC Summary

The QA/QC review entailed reviewing the contract lab Data Reports for sample integrity, correct methodology, and compliance with all appropriate quality Lab Control requirements. The overall data quality assessment found that all data were usable. Appendix B contains the conventional and chemical analysis reports, which include contract laboratory QA/QC narratives.

Any analyses that did not comply with the analytical laboratory QA/QC limits are presented below (also, see final analytical reports in Appendix B for full case narrative).

Total Metals – The RPDs for Lead, Arsenic, Cadmium, and Copper exceeded the QC limits due to non-homogeneity of sample. Due to this non-homogeneity, the MS/MSD did not provide reliable results for accuracy and precision. Sample results for the QC batch were accepted based on LCS/LCSD percent recoveries and RPD values.

Total Organic Carbon (TOC) – The spike recovery was outside of the QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater than the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries that were within the acceptance limits.

Organochlorine Pesticides – The RPDs for 2,4'-DDD, 4,4'-DDD, 4,4'-DDT, and Total DDT exceeded the QC limits due to non-homogeneity of sample.

PAHs – The RPDs for PAHs exceeded the QC limits due to non-homogeneity of sample. The spike recovery in the MS/MSD for several PAHs was outside of the QC limits due to this non-homogeneity.

Organotin Compounds – The monobutyltin RPD between the LCS and LCSD did not meet acceptance criteria, however both have acceptable spike recoveries indicating that the analytical method is meeting acceptability standards. For the MS/MSD of tributyltin, an unidentified peak co-eluted with reported peak, causing interferences with the quantitation of this analyte. As a result, the spike recovery for this QC sample is outside of established control limits.

4.1.7 Deviations from the Sampling and Analysis Plan

There were no deviations from the SAP (PER 2008) for the analytical chemistry phase of this project.

Table 4-1. Sediment grain size analysis results

Analytes	LRT-S01-01	LRT-S01-02	LRT-S01-03	LRT-S01-04	LRT-S01-Z-Layer Comp	Bay Ambient <40% Fines (SFRWQCB 1998)	Bay Ambient <100% Fines (SFRWQCB 1998)
% Gravel	46.4	12.1	29.7	30.3	3.9	-	-
% Sand	18.2	45.9	31.6	22.4	23.4		
% Silt	16.1	26.0	19.3	18.3	49.2		
% Clay	19.3	16.0	19.3	29.0	23.5		
Total % Fines <4 phi	35.4	42.0	38.6	47.3	72.7	-	-

Fines = silt + clays.

Table 4-2. Sediment metals concentrations (mg/kg, dry wt.), total solids (%), and total organic carbon (%)

Metals	LRT-S01-01	LRT-S01-02	LRT-S01-03	LRTC-S01-04	LRT-S01-Z-Layer Comp	Bay Ambient (RWQCB 1998) <40% fines	Bay Ambient <100% Fines (SFRWQCB 1998)
Arsenic	6.26	5.07	6.90	8.87	2.62	13.5	15.3
Cadmium	0.681	0.805	0.252	1.10	0.669	0.25	0.33
Chromium	50.8	49.9	51.8	79.3	47.4	91.4	112
Copper	39.0	31.0	34.5	53.2	93.4	31.7	68.1
Lead	72.3	19.1	21.1	29.5	19.8	20.3	43.2
Mercury	0.439	0.241	0.348	0.467	0.104	0.25	0.43
Nickel	47.5	47.9	47.5	70.5	47.2	92.9	112
Selenium	0.254	0.286	0.285	0.443	0.201	0.59	0.64
Silver	0.301	<0.165	<0.175	0.334	<0.133	0.31	0.58
Zinc	105	96.3	86.4	93.2	60.7	97.8	158
Total Solids (%)	62.7	60.5	57.2	37.7	75.0	-	-
Total Organic Carbon (%)	1.86	1.39	1.12	1.64	0.46	-	-

All results below laboratory method detection limit (MDL) are reported as <MDL

Table 4-3. Sediment organotin concentrations ($\mu\text{g/kg}$, dry wt.)

Organotins	LRT-S01-01	LRT-S01-02	LRT-S01-03	LRT-S01-04	LRT-S01-Z-Layer Comp	Bay Ambient (RWQCB 1998) <40% fines	Bay Ambient <100% Fines (SFRWQCB 1998)
Monobutyltin	<0.88	<0.91	<0.96	<1.46	<0.73	No data available	No data available
Dibutyltin	<1.83	<1.90	<2.01	<3.05	<1.53	No data available	No data available
Tributyltin	<1.58	<1.64	<1.73	<2.63	<1.32	No data available	No data available
Tetrabutyltin	<1.42	<1.47	<1.56	<2.36	<1.19	No data available	No data available
Total Detected Butyltins	<1.42	<1.47	<1.56	<2.36	<1.19	No data available	No data available

All results below laboratory method detection limit (MDL) are reported as <MDL.

Table 4-4. Sediment PCB Aroclor concentrations ($\mu\text{g/kg}$, dry wt)

PCB Aroclors	LRT-S01-01	LRT-S01-02	LRT-S01-03	LRT-S01-04	LRT-S01-Z-Layer Comp	Bay Ambient (RWQCB 1998) <40% fines	Bay Ambient <100% Fines (SFRWQCB 1998)
Aroclor 1016	<1.49	<1.55	<1.64	<2.48	<1.25	see total PCB	see total PCB
Aroclor 1221	<1.49	<1.55	<1.64	<2.48	<1.25	see total PCB	see total PCB
Aroclor 1232	<1.49	<1.55	<1.64	<2.48	<1.25	see total PCB	see total PCB
Aroclor 1242	<1.49	<1.55	<1.64	<2.48	<1.25	see total PCB	see total PCB
Aroclor 1248	<1.49	<1.55	<1.64	<2.48	<1.25	see total PCB	see total PCB
Aroclor 1254	<1.49	44.8	5160	66.3	<1.25	see total PCB	see total PCB
Aroclor 1260	<1.49	<1.55	<1.64	<2.48	<1.25	see total PCB	see total PCB
Total Detected PCBs	<1.49	44.8	5160	66.3	<1.25	8.6	21.6

All results below laboratory method detection limit (MDL) are reported as <MDL.

See next P.

Table 4-5. Sediment PCB Aroclor concentrations ($\mu\text{g/kg}$, dry wt): Re-analysis of LRTC-S01-03 :

PCB Aroclors	Re-extraction of LRT-S01-03	Duplicate Analysis of Re- extracted LRT-S01-03	Analysis of Archived LRT-S01-03	Duplicate Analysis of Archived LRT-S01-03	Mean PCB Aroclor Concentration of LRTC-S01-3	Bay Ambient (RWQCB 1998) <40% fines	Bay Ambient <100% Fines (SFRWQCB 1998)
Aroclor 1016	<16.4	<16.4	<17.9	<17.9	<17.2	see total PCB	see total PCB
Aroclor 1221	<16.4	<16.4	<17.9	<17.9	<17.2	see total PCB	see total PCB
Aroclor 1232	<16.4	<16.4	<17.9	<17.9	<17.2	see total PCB	see total PCB
Aroclor 1242	<16.4	<16.4	<17.9	<17.9	<17.2	see total PCB	see total PCB
Aroclor 1248	<16.4	<16.4	<17.9	<17.9	<17.2	see total PCB	see total PCB
Aroclor 1254	448	338	249	203	310	see total PCB	see total PCB
Aroclor 1260	<16.4	<16.4	<17.9	<17.9	<17.2	see total PCB	see total PCB
Total Detected PCBs	448	338	249	203	310	8.6	21.6

All results below laboratory method detection limit (MDL) are reported as <MDL.

Table 4-6. Sediment organochlorine pesticide concentrations ($\mu\text{g}/\text{kg}$, dry wt.)

Organochlorine Pesticides	LRT-S01-01	LRT-S01-02	LRT-S01-03	LRT-S01-04	LRT-S01-Z- Layer Comp	Bay Ambient (RWQCB 1998) <40% fines	Bay Ambient <100% Fines (SFRWQCB 1998)
Aldrin	<0.16	<0.17	<0.18	<0.27	<0.14	0.42	1.1
a-BHC	<0.09	<0.09	<0.09	<0.14	<0.07	nd	<1
b-BHC	<0.14	<0.14	<0.15	<0.23	<0.11	nd	<1
g-BHC (Lindane)	<0.11	<0.12	<0.12	<0.19	<0.09	nd	<1
d-BHC	<0.13	<0.14	<0.14	<0.22	<0.11	nd	<1
Chlordane	<1.52	<1.57	<1.66	<2.53	<1.27	0.42	1.1
Dieldrin	33.5	2.27	<0.16	3.93	1.01	0.18	0.44
Endosulfan I	<0.13	<0.14	<0.15	<0.22	<0.11	nd	<1
Endosulfan II	<0.24	<0.25	<0.27	<0.40	<0.20	nd	<1
Endosulfan sulfate	<0.15	<0.16	<0.17	<0.25	<0.13	nd	<1
Endrin	<0.16	<0.16	<0.17	<0.26	<0.13	0.31	0.78
Endrin aldehyde	<0.10	<0.10	<0.10	<0.16	<0.08	nd	<1
Heptachlor	<0.23	<0.23	<0.25	<0.38	<0.19	nd	<1
Heptachlor epoxide	<0.22	<0.23	<0.24	<0.37	<0.19	nd	<1
Toxaphene	<5.61	<5.82	<6.15	<9.34	<4.69	nd	<10
2,4'-DDD	72.7	9.35	<0.43	15.7	3.63	see total DDT	see total DDT
4,4'-DDD	302	27.2	<0.17	46.9	11.4	see total DDT	see total DDT
2,4'-DDE	<17.2	<1.43	<0.38	<2.86	<0.58	see total DDT	see total DDT
4,4'-DDE	116	16.1	<0.16	12.7	4.10	see total DDT	see total DDT
2,4'-DDT	<31.9	<2.64	<0.70	<5.31	<1.07	see total DDT	see total DDT
4,4'-DDT	41.5	2.42	<0.11	16.8	1.03	see total DDT	see total DDT
Total Detected DDT	532	55.1	<0.11	92.1	20.2	2.8	7.0

All results below laboratory method detection limit (MDL) are reported as < the MDL

Table 4-7. Sediment PAH concentrations ($\mu\text{g/kg}$, dry wt)

PAHs	LRT-S01-01	LRT-S01-02	LRT-S01-03	LRT-S01-04	LRT-S01-Z- Layer Comp	Bay Ambient (RWQCB 1998) <40% fines	Bay Ambient <100% Fines (SFRWQCB 1998)
Acenaphthene	97.4	<5.95	95.0	<9.55	21.3	2.2	31.7
Acenaphthylene	9.25J	<7.74	<8.18	<12.4	<6.24	11.3	26.6
Anthracene	158	30.5	100	<16.7	17.6	9.3	88
Benzo(a)anthracene	333	81.3	72.8	29.9	18.1	15.9	244
Benzo(a)pyrene	231	90.1	62.2	35.3	17.5	32.1	412
Benzo(b)fluoranthene	329	107	80.6	43.8	24.1	29.2	371
Benzo(g,h,i)perylene	33.8	17.8	<17.0	<25.8	<13.0	22.9	310
Benzo(k)fluoranthene	131	43.1	32.5	<18.1	10.5	18.1	258
Chrysene	549	163	112	59.4	29.8	19.4	289
Dibenzo(a,h)anthracene	25.0	<15.2	<16.0	<24.4	<12.2	3	32.7
Fluoranthene	753	102	256	76.8	57.2	78.7	514
Fluorene	77.5	9.07	75.5	<12.4	17.8	4	25.3
Indeno(1,2,3-cd)pyrene	58.4	22.0	<17.5	<26.5	<13.3	19	382
Naphthalene	106	14.6	87.0	8.78	41.5	8.8	55.8
Phenanthrene	282	32.5	170	21.3	51.1	17.8	237
Pyrene	1180	197	261	120	98.7	64.6	665
Total Detected PAHs	4350	909	1410	396	405	211*	3390*

All results below laboratory method detection limit (MDL) are reported as <MDL.

J - Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.

*Total PAH value represents the 85th percentile total PAHs concentration (various combinations of above 16 PAHs). As a result the total PAHs is not equal to the sum of the 85th percentile concentration of the each individual PAH.

5. SUMMARY

Sediment cores from four sample locations representative of sediments from the mudline to -41 ft MLLW and a composite sediment sample of the 41 ft-41.5 ft MLLW sediment horizon (designated the "Z-Layer") collected from within the Levin-Richmond Terminal Corporation Berth A were submitted for full chemical and conventional analyses. With the exception of total DDTs, dieldrin, and total aroclors, all analytical chemistry results for organic compounds were generally within reported ambient background concentration ranges for San Francisco Bay (SFRWQCB 1998). With the exception of cadmium and copper, this trend was similarly observed for trace metals. The measured concentration of total DDTs, dieldrin, and total aroclors in the "Z-Layer" were significantly less than those observed in the sediment core samples. Due to the elevated total DDTs and total PCBs observed in the sediment core samples, these sediments would not be suitable for in-bay disposal. Previous testing performed on LRTC Berth A sediments indicated that the sediments were suitable for disposal at Montezuma (PER 2008). The current sediments have DDT concentrations similar to those previously disposed at Montezuma and LRTC is currently evaluating the feasibility of disposing of this material at Montezuma or other appropriate disposal site.

6. REFERENCES

- PER (2008) Sediment Characterization Sampling and Analysis Plan (SAP) for the Levin Richmond Terminal Corporation Berth A: Dredge Maintenance Program. Pacific EcoRisk, Martinez, CA.
- SFRWQCB (1998) Ambient concentrations of toxic chemicals in San Francisco Bay Sediments: Draft Staff Report. San Francisco Regional Water Quality Lab Control Board, Oakland, CA.
- USEPA/USACE (1998) Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S. – Testing Manual – Inland Testing Manual. U.S. Environmental Protection Agency/U.S. Army Corps of Engineers. EPA-823-B-94-002. U.S. Environmental Protection Agency, Office of Water (4305).

Appendix A

Sampling Field Logs and Data Sheets

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-01.1 Sampling Date: 12/1/08 Time: 14:00
 Project Name: Levin Richmond Terminal Project Number: 122°22' 01.1"
 Latitude/Northing: 37° 55' 01.4" Longitude/Easting: _____
 Notes/Comments: Core Collected 5' off wharf at Corner.
Discarded bottom 0.5', Retrieved 0.5'-1.0' as Z-layer. 1.0'-4.5' - 4.5'
went into Large Bag. (4.5' Core)

Core collection

Vertical datum ☒ MLLW ☐ MLW ☐ Other: _____
 Method of depth measurement: _____ Sounder ☒ Lead line
 Project depth (if dredging) 39' ft Overdredge? 2.5' ft
 A Measured water depth 43.0' ft Time: 14:00
 B Tide height: 5.5' ft Time: _____
 C Mudline elevation: 37.5' ft
 (A-B=C; be sure to include the sign of the tide height as reported)
 Estimated penetration 4.5' ft Refusal encountered? (Y or N) Y
 Total core length from tip of core nose: 4.5' ft

Visible core characteristics

Appears homogeneous: _____ Strata/layers: _____
 Description of layers Distance from top of core (ft) Thickness (if applicable)(ft)

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	none H ₂ S	
gravel	<u>black</u>	<u>slight</u> <u>petroleum</u>	
<u>sand & M F</u>	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olivine		

Signature: _____

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-01.2 Sampling Date: 12/1/08 Time: 1440
 Project Name: Levin. Eichmann Terminal Project Number: _____
 Latitude/Northing: 37° 55' 01.4" Longitude/Easting: 122° 22' 01.1"
 Notes/Comments: Discard bottom 0.5', retained 0.5' - 1.0' as 2-layer, retained 1.0' - 3.8' - 4.3' as main sample. (4.3' core)

Core collection

Vertical datum MLLW ☒ MLLW ☐ MLW ☐ Other: _____
 Method of depth measurement: ☐ Sounder ☒ Lead line
 Project depth (if dredging) 39' ft Overdredge? 2.5' ft
 A Measured water depth 42.8' ft Time: 1440
 B Tide height: 5.1' ft Time: _____
 C Mudline elevation: 37.7' ft
 (A-B=C; be sure to include the sign of the tide height as reported)
 Estimated penetration 4.3' ft Refusal encountered? (Y or N) Y
 Total core length from tip of core nose: 4.3' ft

Visible core characteristics

Appears homogeneous: ☐ Strata/layers: ☒
 Description of layers Distance from top of core (ft) Thickness (if applicable)(ft)

Description of layers	Distance from top of core (ft)	Thickness (if applicable)(ft)

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	none H ₂ S	
gravel	<u>black</u>	<u>slight</u> <u>petroleum</u>	
<u>sand C M F</u>	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olivine		

Signature: _____

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-02.1 Sampling Date: 12/01/08 Time: 12:30

Project Name: Lexington Richmond terminal Project Number: _____

Latitude/Northing: 37° 55' 09.0" Longitude/Easting: 122° 21' 58.7"

Notes/Comments: could not get 2' longer in 1st 2' plate not as we were unable to penetrate to project depth. we were 0.1' short of the 41' project depth, so core was retained however we were unable to collect 2' longer due to refusal.

Core collection

Vertical datum: ☒ MLLW ☐ MLW ☐ Other: _____

Method of depth measurement: ☐ Sounder ☒ Lead line

Project depth (if dredging): 39.0' ft Overdredge? 2.5' ft

A Measured water depth: 43.0' 40.3' ft Time: 12:30

B Tide height: 5.7 ft 6.6' Time: _____

C Mudline elevation: 37.3 34.8 ft 6.6'

(A-B=C; be sure to include the sign of the tide height as reported)

Estimated penetration: 6.0' ft Refusal encountered? (Y or N) Y

Total core length from tip of core nose: 6.0' ft

Visible core characteristics

Appears homogeneous: Description of layers	Strata/layers: Distance from top of core (ft)	Thickness (if applicable)(ft)

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	none H ₂ S	
gravel	<u>black</u>	<u>slight</u> <u>petroleum</u>	
<u>sand C M F</u>	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olivine		

Signature: *A. J. [unclear]*

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-S01-02.2 Sampling Date: 12/1/08 Time: 1300
 Project Name: _____ Project Number: _____
 Latitude/Northing: 37.5509.0 Longitude/Easting: 122.2157.7
 Notes/Comments: Refusal encountered, returned bottom 0.3' for 2 layers

Core collection

Vertical datum: ☒ MLLW ☐ MLW ☐ Other: _____
 Method of depth measurement: ☒ Sounder ☐ Lead line
 Project depth (if dredging): 44.39 ft 5.2 ft Overdredge? 2.5 ft
 A Measured water depth: 42 ft Time: 1300
 B Tide height: 5.7 ft Time: _____
 C Mudline elevation: 36.3 ft
 (A-B=C; be sure to include the sign of the tide height as reported)
 Estimated penetration: 5.0' ft Refusal encountered? (Y or N) Y
 Total core length from tip of core nose: 5.0' ft

Visible core characteristics

Appears homogeneous: _____ Strata/layers: _____
 Description of layers: _____ Distance from top of core (ft): _____ Thickness (if applicable)(ft): _____

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	<u>none</u> H ₂ S	
gravel	<u>black</u>	slight petroleum	
<u>sand C M F</u>	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olivine		

Signature: _____

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-S01-02.3 Sampling Date: 12/1/08 Time: 13:20
 Project Name: _____ Project Number: _____
 Latitude/Northing: 37.55'09.0" Longitude/Easting: 122.21587"
 Notes/Comments: Retained bottom 0.5 ft for Z-Layer analysis

Core collection

Vertical datum ☒ MLLW ☐ MLW ☐ Other: _____
 Method of depth measurement: _____ Sounder ☒ Lead line
 Project depth (if dredging) 44.39 ft Overdredge? 2.5 ft
 A Measured water depth 42.0 ft Time: 1330
 B Tide height: 5.6 ft Time: _____
 C Mudline elevation: 36.4 ft (5.1)
 (A-B=C; be sure to include the sign of the tide height as reported)
 Estimated penetration 5.1 ft Refusal encountered? (Y or N) Y
 Total core length from tip of core nose: - ft

Visible core characteristics

Appears homogeneous: _____ Strata/layers: _____
 Description of layers Distance from top of core (ft) Thickness (if applicable)(ft)

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	<u>none</u> H ₂ S	
gravel	<u>black</u>	slight petroleum	
<u>sand C.M.F.</u>	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olivine		

Signature: [Signature]

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-03.1 Sampling Date: 12/01/08 Time: 11:50

Project Name: Levin - Richmond Terminal Project Number:

Latitude/Northing: 37° 55' 08.5" Longitude/Easting: 122° 21' 57.6"

Notes/Comments: Collected Cone $\frac{1}{2}$ off wharf from ~100' SW

Core collection

Vertical datum MLLW MLW Other: _____

Method of depth measurement: Sounder ☒ Lead line

Project depth (if dredging) 39 ft Overdredge? 2.5 ft

A Measured water depth: 42.5' ft Time: 11:50

B Tide height: 5.3 ft Time: _____

C Mudline elevation: \$ 37.2 ft

(A-B=C; be sure to include the sign of the tide height as reported)

Estimated penetration 4.3' ft Refusal encountered? (Y or N) N

Total core length from tip of core nose: 4.3' ft

Visible core characteristics

Appears homogeneous:	Strata/layers:	
<i>Description of layers</i>	<i>Distance from top of core (ft)</i>	<i>Thickness (if applicable) (ft)</i>

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	none	Oily sheen on sediment surface when core emptied, note sample bag.
gravel	black	slight	
sand C M F	brown	moderate	
silt clay	brown surface	strong	
organic matter	olivine		

Signature: *G. [illegible]*

(Rev.04/02)

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-03.2 Sampling Date: 12/1/08 Time: 12:15
 Project Name: Levin Richmond Terminal Object Number: _____
 Latitude/Northing: 37° 55' 08.3" Longitude/Easting: 122° 21' 57.7"
 Notes/Comments: Retained 2- longer separately

Core collection

Vertical datum: ☒ MLLW ☐ MLW ☐ Other: _____
 Method of depth measurement: _____ Sounder ☒ Lead line
 Project depth (if dredging) 39' ft Overdredge? 2.5' ft
 A Measured water depth 42.6 ft Time: 12:15
 B Tide height: 5.5 ft Time: _____
 C Mudline elevation: 37.1 ft
 (A-B=C; be sure to include the sign of the tide height as reported)
 Estimated penetration 4.4' ft Refusal encountered? (Y or N) Y
 Total core length from tip of core nose: 4.4' ft

Visible core characteristics

Appears homogeneous: _____ Strata/layers: _____
 Description of layers Distance from top of core (ft) Thickness (if applicable)(ft)

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	none H ₂ S	
gravel	<u>black</u>	<u>slight</u> <u>petroleum</u>	
<u>sand C.M.S</u>	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olive		

Signature: A. Starks

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-04.1 Sampling Date: 12/01/08 Time: 10:45
 Project Name: Levin- Richmond Terminal Project Number: _____
 Latitude/Northing: 37° 55' 07.6' Longitude/Easting: 122° 21' 56.5"
 Notes/Comments: 33.4
Collected 2-lane into 1 gal 2. plastic. Hit refusal, 6.8 was
deepest we could go
 2nd Core: 37° 55' 07.7 122° 21' 56.4' - refusal

Core collection																							
Vertical datum		<input checked="" type="checkbox"/> MLLW	MLW																				
Method of depth measurement:		Sounder	<input checked="" type="checkbox"/> Lead line																				
Project depth (if dredging)		<u>39'</u> ft <u>41.5</u>	Overdredge? <u>2.5'</u> ft																				
A	Measured water depth	<u>44.3 38.2</u> ft <u>38.4</u>	Time: <u>10:45</u>																				
B	Tide height:	<u>4.8</u> ft <u>8.1</u>	Time: _____																				
C	Mudline elevation:	<u>39.5 34.2</u> ft <u>34.2</u>																					
(A-B=C; be sure to include the sign of the tide height as reported) <u>7.3</u>																							
Estimated penetration		<u>6.8' 6.3'</u> ft	Refusal encountered? (Y or N) <u>Y</u>																				
Total core length from tip of core nose:		<u>6.8'</u> ft																					
Visible core characteristics																							
Appears homogeneous:		Strata/layers:																					
Description of layers		Distance from top of core (ft)	Thickness (if applicable)(ft)																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Sediment type:</td> <td style="width: 20%;">Sediment color:</td> <td style="width: 20%;">Sediment odor:</td> <td style="width: 40%;">Comments:</td> </tr> <tr> <td>cobble</td> <td>gray</td> <td>none <u>H₂S</u></td> <td rowspan="5"> </td> </tr> <tr> <td>gravel</td> <td><u>black</u></td> <td><u>slight</u> petroleum</td> </tr> <tr> <td>sand C M F</td> <td><u>brown</u></td> <td>moderate septic</td> </tr> <tr> <td><u>silt clay</u></td> <td>brown surface</td> <td>strong</td> </tr> <tr> <td>organic matter</td> <td>olivine</td> <td> </td> </tr> </table>				Sediment type:	Sediment color:	Sediment odor:	Comments:	cobble	gray	none <u>H₂S</u>		gravel	<u>black</u>	<u>slight</u> petroleum	sand C M F	<u>brown</u>	moderate septic	<u>silt clay</u>	brown surface	strong	organic matter	olivine	
Sediment type:	Sediment color:	Sediment odor:	Comments:																				
cobble	gray	none <u>H₂S</u>																					
gravel	<u>black</u>	<u>slight</u> petroleum																					
sand C M F	<u>brown</u>	moderate septic																					
<u>silt clay</u>	brown surface	strong																					
organic matter	olivine																						

Signature: [Signature]

SEDIMENT CORE COLLECTION FORM

Station ID: LRT-501-04.2 Sampling Date: 12/01/08 Time: 11:30
 Project Name: Levir - Retirement Terminal Project Number: _____
 Latitude/Northing: 37° 55' 07.7 Longitude/Easting: 122° 21' 56.4'
 Notes/Comments: Collected Core 3' off piling next to ladder.

Core collection

Vertical datum MLLW MLW Other: _____
 Method of depth measurement: _____ Sounder ☒ Lead line
 Project depth (if dredging) 39' ft Overdredge? 2.5 ft
 A Measured water depth 39' ft Time: 11:30
 B Tide height: 5.2' ft Time: _____
 C Mudline elevation: 33.8' ft
 (A-B=C; be sure to include the sign of the tide height as reported)
 Estimated penetration 7.7' ft Refusal encountered? (Y or N) Y
 Total core length from tip of core nose: 7.7' ft

Visible core characteristics

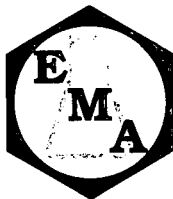
Appears homogeneous: Description of layers	Strata/layers: Distance from top of core (ft)	Thickness (if applicable)(ft)

Sediment type:	Sediment color:	Sediment odor:	Comments:
cobble	gray	none <u>H₂S</u>	
gravel	<u>black</u>	<u>slight</u> petroleum	
<u>sand</u> C&F	brown	moderate septic	
<u>silt clay</u>	brown surface	strong	
organic matter	olivine		

Signature: [Signature]

Appendix B

Analytical Chemistry Laboratory Data Report Submitted by EnviroMatrix, Inc.



16 January 2009

Pacific Ecorisk
Attn: Jeff Cotsifas
2250 Cordelia Road
Fairfield, California 94534

EMA Log #: 0812170

Project Name: Levin-Richmond Terminal

Enclosed are the results of analyses for samples received by the laboratory on 12/04/08 10:38. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that this data is in compliance both technically and for completeness.

Dan Verdon
Laboratory Director

CA ELAP Certification #: 2564

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
LRT-S01-01	0812170-01	Sediment	12/01/08 14:00	12/04/08 10:38
LRT-S01-02	0812170-02	Sediment	12/01/08 12:30	12/04/08 10:38
LRT-S01-03	0812170-03	Sediment	12/01/08 11:50	12/04/08 10:38
LRT-S01-04	0812170-04	Sediment	12/01/08 10:45	12/04/08 10:38
LRT-S01-Z Layer Comp	0812170-05	Sediment	12/01/08 10:45	12/04/08 10:38

NOTE: Grain Size analyses were performed by a sub-contract laboratory, results to follow in a separate report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Total Metals by EPA 6000/7000 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
Silver	0.301	0.159	0.159	mg/kg dry	1	8121914	12/19/08	12/19/08	EPA 6020	
Arsenic	6.26	0.319	0.797	"	"	"	"	"	"	
Cadmium	0.681	0.159	0.159	"	"	"	"	"	"	
Chromium	50.8	0.638	1.59	"	"	"	"	"	"	
Copper	39.0	0.638	0.797	"	"	"	"	"	"	
Mercury	0.439	0.016	0.016	"	"	8121609	12/16/08	12/16/08	EPA 7471	
Nickel	47.5	0.319	1.59	"	"	8121914	12/19/08	12/19/08	EPA 6020	
Lead	72.3	0.159	0.797	"	"	"	"	"	"	
Selenium	0.254	0.00638	0.0797	"	"	"	"	"	"	
Zinc	105	3.51	7.97	"	"	"	"	"	"	
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Silver	ND	0.165	0.165	mg/kg dry	1	8121914	12/19/08	12/19/08	EPA 6020	
Arsenic	5.07	0.331	0.826	"	"	"	"	"	"	
Cadmium	0.805	0.165	0.165	"	"	"	"	"	"	
Chromium	49.9	0.661	1.65	"	"	"	"	"	"	
Copper	31.0	0.661	0.826	"	"	"	"	"	"	
Mercury	0.241	0.017	0.017	"	"	8121609	12/16/08	12/16/08	EPA 7471	
Nickel	47.9	0.331	1.65	"	"	8121914	12/19/08	12/19/08	EPA 6020	
Lead	19.1	0.165	0.826	"	"	"	"	"	"	
Selenium	0.286	0.00661	0.0826	"	"	"	"	"	"	
Zinc	96.3	3.64	8.26	"	"	"	"	"	"	
LRT-S01-03 (0812170-03) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
Silver	ND	0.175	0.175	mg/kg dry	1	8121914	12/19/08	12/19/08	EPA 6020	
Arsenic	6.90	0.350	0.874	"	"	"	"	"	"	
Cadmium	0.252	0.175	0.175	"	"	"	"	"	"	
Chromium	51.8	0.699	1.75	"	"	"	"	"	"	
Copper	34.5	0.699	0.874	"	"	"	"	"	"	
Mercury	0.348	0.017	0.017	"	"	8121609	12/16/08	12/16/08	EPA 7471	
Nickel	47.5	0.350	1.75	"	"	8121914	12/19/08	12/19/08	EPA 6020	
Lead	21.1	0.175	0.874	"	"	"	"	"	"	
Selenium	0.285	0.00699	0.0874	"	"	"	"	"	"	
Zinc	86.4	3.85	8.74	"	"	"	"	"	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Total Metals by EPA 6000/7000 Series Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Silver	0.334	0.265	0.265	mg/kg dry	1	8121914	12/19/08	12/19/08	EPA 6020	
Arsenic	8.87	0.531	1.33	"	"	"	"	"	"	
Cadmium	1.10	0.265	0.265	"	"	"	"	"	"	
Chromium	79.3	1.06	2.65	"	"	"	"	"	"	
Copper	53.2	1.06	1.33	"	"	"	"	"	"	
Mercury	0.467	0.027	0.027	"	"	8121609	12/16/08	12/16/08	EPA 7471	
Nickel	70.5	0.531	2.65	"	"	8121914	12/19/08	12/19/08	EPA 6020	
Lead	29.5	0.265	1.33	"	"	"	"	"	"	
Selenium	0.443	0.0106	0.133	"	"	"	"	"	"	
Zinc	93.2	5.84	13.3	"	"	"	"	"	"	
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Silver	ND	0.133	0.133	mg/kg dry	1	8121914	12/19/08	12/19/08	EPA 6020	
Arsenic	2.62	0.267	0.667	"	"	"	"	"	"	
Cadmium	0.669	0.133	0.133	"	"	"	"	"	"	
Chromium	47.4	0.533	1.33	"	"	"	"	"	"	
Copper	93.4	0.533	0.667	"	"	"	"	"	"	
Mercury	0.104	0.013	0.013	"	"	8121609	12/16/08	12/16/08	EPA 7471	
Nickel	47.2	0.267	1.33	"	"	8121914	12/19/08	12/19/08	EPA 6020	
Lead	19.8	0.133	0.667	"	"	"	"	"	"	
Selenium	0.201	0.00533	0.0667	"	"	"	"	"	"	
Zinc	60.7	2.93	6.67	"	"	"	"	"	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Sediment Chemistry Methodologies (reported in dry weight)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
Total Organic Carbon	1.86	0.010	0.010	% dry	1	8120909	12/09/08	12/09/08	EPA 9060 mod	
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Total Organic Carbon	1.39	0.010	0.010	% dry	1	8120909	12/09/08	12/09/08	EPA 9060 mod	
LRT-S01-03 (0812170-03) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
Total Organic Carbon	1.12	0.010	0.010	% dry	1	8120909	12/09/08	12/09/08	EPA 9060 mod	
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Total Organic Carbon	1.64	0.010	0.010	% dry	1	8120909	12/09/08	12/09/08	EPA 9060 mod	
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Total Organic Carbon	0.459	0.010	0.010	% dry	1	8120909	12/09/08	12/09/08	EPA 9060 mod	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
Aldrin	ND	0.16	0.64	ug/kg dry	1	8120521	12/05/08	12/16/08	EPA 8081	
alpha-BHC	ND	0.09	0.64	"	"	"	"	"	"	
beta-BHC	ND	0.14	0.64	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.11	0.64	"	"	"	"	"	"	
delta-BHC	ND	0.13	0.64	"	"	"	"	"	"	
Total BHCs	ND	0.09	0.64	"	"	"	"	"	"	
Chlordane (Total)	ND	1.52	1.63	"	"	"	"	"	"	
2,4'-DDD	72.7	19.5	31.9	"	50	"	"	"	"	R-07
4,4'-DDD	302	7.81	31.9	"	"	"	"	"	"	R-07
2,4'-DDE	ND	17.2	31.9	"	"	"	"	"	"	R-07
4,4'-DDE	116	7.50	31.9	"	"	"	"	"	"	R-07
2,4'-DDT	ND	31.9	31.9	"	"	"	"	"	"	R-07
4,4'-DDT	41.5	5.10	31.9	"	"	"	"	"	"	R-07
Total DDT	532	5.10	31.9	"	"	"	"	"	"	R-07
Dieldrin	33.5	7.50	31.9	"	"	"	"	"	"	R-07
Endosulfan I	ND	0.13	0.64	"	1	"	"	"	"	
Endosulfan II	ND	0.24	0.64	"	"	"	"	"	"	
Endosulfan sulfate	ND	0.15	0.64	"	"	"	"	"	"	
Endrin	ND	0.16	0.64	"	"	"	"	"	"	
Endrin aldehyde	ND	0.10	0.64	"	"	"	"	"	"	
Heptachlor	ND	0.23	0.64	"	"	"	"	"	"	
Heptachlor epoxide	ND	0.22	0.64	"	"	"	"	"	"	
Methoxychlor	ND	0.24	1.28	"	"	"	"	"	"	
Toxaphene	ND	5.61	7.91	"	"	"	"	"	"	
Surrogate: TCMX		85 %	26-146			"	"	12/12/08	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Aldrin	ND	0.17	0.66	ug/kg dry	1	8120521	12/05/08	12/16/08	EPA 8081	
alpha-BHC	ND	0.09	0.66	"	"	"	"	"	"	
beta-BHC	ND	0.14	0.66	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.12	0.66	"	"	"	"	"	"	
delta-BHC	ND	0.14	0.66	"	"	"	"	"	"	
Total BHCs	ND	0.09	0.66	"	"	"	"	"	"	
Chlordane (Total)	ND	1.57	1.69	"	"	"	"	"	"	
2,4'-DDD	9.35	1.61	2.64	"	4	"	"	"	"	R-07
4,4'-DDD	27.2	0.65	2.64	"	"	"	"	"	"	R-07
2,4'-DDE	ND	1.43	2.64	"	"	"	"	"	"	R-07
4,4'-DDE	16.1	0.62	2.64	"	"	"	"	"	"	R-07
2,4'-DDT	ND	2.64	2.64	"	"	"	"	"	"	R-07
4,4'-DDT	2.42	0.42	2.64	"	"	"	"	"	"	R-07, J
Total DDT	55.1	0.42	2.64	"	"	"	"	"	"	R-07
Dieldrin	2.27	0.16	0.66	"	1	"	"	12/12/08	"	
Endosulfan I	ND	0.14	0.66	"	"	"	"	12/16/08	"	
Endosulfan II	ND	0.25	0.66	"	"	"	"	"	"	
Endosulfan sulfate	ND	0.16	0.66	"	"	"	"	"	"	
Endrin	ND	0.16	0.66	"	"	"	"	"	"	
Endrin aldehyde	ND	0.10	0.66	"	"	"	"	"	"	
Heptachlor	ND	0.23	0.66	"	"	"	"	"	"	
Heptachlor epoxide	ND	0.23	0.66	"	"	"	"	"	"	
Methoxychlor	ND	0.24	1.32	"	"	"	"	"	"	
Toxaphene	ND	5.82	8.20	"	"	"	"	"	"	
<i>Surrogate: TCMX</i>		82 %	26-146			"	"	12/12/08	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-03 (0812170-03) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
Aldrin	ND	0.18	0.70	ug/kg dry	1	8120521	12/05/08	12/17/08	EPA 8081	
alpha-BHC	ND	0.09	0.70	"	"	"	"	"	"	
beta-BHC	ND	0.15	0.70	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.12	0.70	"	"	"	"	"	"	
delta-BHC	ND	0.14	0.70	"	"	"	"	"	"	
Total BHCs	ND	0.09	0.70	"	"	"	"	"	"	
Chlordane (Total)	ND	1.66	1.78	"	"	"	"	"	"	
2,4'-DDD	ND	0.43	0.70	"	"	"	"	"	"	
4,4'-DDD	ND	0.17	0.70	"	"	"	"	"	"	
2,4'-DDE	ND	0.38	0.70	"	"	"	"	"	"	
4,4'-DDE	ND	0.16	0.70	"	"	"	"	"	"	
2,4'-DDT	ND	0.70	0.70	"	"	"	"	"	"	
4,4'-DDT	ND	0.11	0.70	"	"	"	"	"	"	
Total DDT	ND	0.11	0.70	"	"	"	"	"	"	
Dieldrin	ND	0.16	0.70	"	"	"	"	"	"	
Endosulfan I	ND	0.15	0.70	"	"	"	"	"	"	
Endosulfan II	ND	0.27	0.70	"	"	"	"	"	"	
Endosulfan sulfate	ND	0.17	0.70	"	"	"	"	"	"	
Endrin	ND	0.17	0.70	"	"	"	"	"	"	
Endrin aldehyde	ND	0.10	0.70	"	"	"	"	"	"	
Heptachlor	ND	0.25	0.70	"	"	"	"	"	"	
Heptachlor epoxide	ND	0.24	0.70	"	"	"	"	"	"	
Methoxychlor	ND	0.26	1.40	"	"	"	"	"	"	
Toxaphene	ND	6.15	8.67	"	"	"	"	"	"	
Surrogate: TCMX		83 %	26-146			"	"	12/12/08	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Aldrin	ND	0.27	1.06	ug/kg dry	1	8120521	12/05/08	12/16/08	EPA 8081	
alpha-BHC	ND	0.14	1.06	"	"	"	"	"	"	
beta-BHC	ND	0.23	1.06	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.19	1.06	"	"	"	"	"	"	
delta-BHC	ND	0.22	1.06	"	"	"	"	"	"	
Total BHCs	ND	0.14	1.06	"	"	"	"	"	"	
Chlordane (Total)	ND	2.53	2.71	"	"	"	"	"	"	
2,4'-DDD	15.7	3.24	5.31	"	5	"	"	"	"	R-07
4,4'-DDD	46.9	1.30	5.31	"	"	"	"	"	"	R-07
2,4'-DDE	ND	2.86	5.31	"	"	"	"	"	"	R-07
4,4'-DDE	12.7	1.25	5.31	"	"	"	"	"	"	R-07
2,4'-DDT	ND	5.31	5.31	"	"	"	"	"	"	R-07
4,4'-DDT	16.8	0.85	5.31	"	"	"	"	"	"	R-07
Total DDT	92.1	0.85	5.31	"	"	"	"	"	"	R-07
Dieldrin	3.93	0.25	1.06	"	1	"	"	12/12/08	"	
Endosulfan I	ND	0.22	1.06	"	"	"	"	12/16/08	"	
Endosulfan II	ND	0.40	1.06	"	"	"	"	"	"	
Endosulfan sulfate	ND	0.25	1.06	"	"	"	"	"	"	
Endrin	ND	0.26	1.06	"	"	"	"	"	"	
Endrin aldehyde	ND	0.16	1.06	"	"	"	"	"	"	
Heptachlor	ND	0.38	1.06	"	"	"	"	"	"	
Heptachlor epoxide	ND	0.37	1.06	"	"	"	"	"	"	
Methoxychlor	ND	0.39	2.12	"	"	"	"	"	"	
Toxaphene	ND	9.34	13.2	"	"	"	"	"	"	
Surrogate: TCMX		66 %	26-146			"	"	12/12/08	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Aldrin	ND	0.14	0.53	ug/kg dry	1	8120521	12/05/08	12/16/08	EPA 8081	
alpha-BHC	ND	0.07	0.53	"	"	"	"	"	"	
beta-BHC	ND	0.11	0.53	"	"	"	"	"	"	
gamma-BHC (Lindane)	ND	0.09	0.53	"	"	"	"	"	"	
delta-BHC	ND	0.11	0.53	"	"	"	"	"	"	
Total BHCs	ND	0.07	0.53	"	"	"	"	"	"	
Chlordane (Total)	ND	1.27	1.36	"	"	"	"	"	"	
2,4'-DDD	3.63	0.65	1.07	"	2	"	"	"	"	R-07
4,4'-DDD	11.4	0.26	1.07	"	"	"	"	"	"	R-07
2,4'-DDE	ND	0.58	1.07	"	"	"	"	"	"	R-07
4,4'-DDE	4.10	0.25	1.07	"	"	"	"	"	"	R-07
2,4'-DDT	ND	1.07	1.07	"	"	"	"	"	"	R-07
4,4'-DDT	1.03	0.17	1.07	"	"	"	"	"	"	R-07, J
Total DDT	20.2	0.17	1.07	"	"	"	"	"	"	R-07
Dieldrin	1.01	0.13	0.53	"	1	"	"	12/12/08	"	
Endosulfan I	ND	0.11	0.53	"	"	"	"	12/16/08	"	
Endosulfan II	ND	0.20	0.53	"	"	"	"	"	"	
Endosulfan sulfate	ND	0.13	0.53	"	"	"	"	"	"	
Endrin	ND	0.13	0.53	"	"	"	"	"	"	
Endrin aldehyde	ND	0.08	0.53	"	"	"	"	"	"	
Heptachlor	ND	0.19	0.53	"	"	"	"	"	"	
Heptachlor epoxide	ND	0.19	0.53	"	"	"	"	"	"	
Methoxychlor	ND	0.20	1.07	"	"	"	"	"	"	
Toxaphene	ND	4.69	6.61	"	"	"	"	"	"	
Surrogate: TCMX		70 %	26-146			"	"	12/12/08	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
Aroclor 1016	ND	1.49	6.38	ug/kg dry	1	8120521	12/05/08	12/12/08	EPA 8082	
Aroclor 1221	ND	1.49	6.38	"	"	"	"	"	"	
Aroclor 1232	ND	1.49	6.38	"	"	"	"	"	"	
Aroclor 1242	ND	1.49	6.38	"	"	"	"	"	"	
Aroclor 1248	ND	1.49	6.38	"	"	"	"	"	"	
Aroclor 1254	ND	1.49	6.38	"	"	"	"	"	"	
Aroclor 1260	ND	1.49	6.38	"	"	"	"	"	"	
Total Aroclors	ND	1.49	6.38	"	"	"	"	"	"	
Surrogate: TCMX		85 %	26-146			"	"	"	"	
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Aroclor 1016	ND	1.55	6.61	ug/kg dry	1	8120521	12/05/08	12/12/08	EPA 8082	
Aroclor 1221	ND	1.55	6.61	"	"	"	"	"	"	
Aroclor 1232	ND	1.55	6.61	"	"	"	"	"	"	
Aroclor 1242	ND	1.55	6.61	"	"	"	"	"	"	
Aroclor 1248	ND	1.55	6.61	"	"	"	"	"	"	
Aroclor 1254	44.8	1.55	6.61	"	"	"	"	"	"	
Aroclor 1260	ND	1.55	6.61	"	"	"	"	"	"	
Total Aroclors	44.8	1.55	6.61	"	"	"	"	"	"	
Surrogate: TCMX		82 %	26-146			"	"	"	"	
LRT-S01-03 (0812170-03) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
Aroclor 1016	ND	1.64	6.99	ug/kg dry	1	8120521	12/05/08	12/12/08	EPA 8082	
Aroclor 1221	ND	1.64	6.99	"	"	"	"	"	"	
Aroclor 1232	ND	1.64	6.99	"	"	"	"	"	"	
Aroclor 1242	ND	1.64	6.99	"	"	"	"	"	"	
Aroclor 1248	ND	1.64	6.99	"	"	"	"	"	"	
Aroclor 1254	5160	164	699	"	100	"	"	"	"	R-07
Aroclor 1260	ND	1.64	6.99	"	1	"	"	"	"	
Total Aroclors	5160	164	699	"	100	"	"	"	"	
Surrogate: TCMX		83 %	26-146			"	"	"	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-03 (0812170-03RE2) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										HT-03
Aroclor 1016	ND	16.4	69.9	ug/kg dry	10	9011206	01/12/08	01/14/09	EPA 8082	
Aroclor 1221	ND	16.4	69.9	"	"	"	"	"	"	
Aroclor 1232	ND	16.4	69.9	"	"	"	"	"	"	
Aroclor 1242	ND	16.4	69.9	"	"	"	"	"	"	
Aroclor 1248	ND	16.4	69.9	"	"	"	"	"	"	
Aroclor 1254	448	16.4	69.9	"	"	"	"	"	"	
Aroclor 1260	ND	16.4	69.9	"	"	"	"	"	"	
Total Aroclors	448	16.4	69.9	"	"	"	"	"	"	
<i>Surrogate: TCMX</i>										
		73 %	26-146			"	"	"	"	
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Aroclor 1016	ND	2.48	10.6	ug/kg dry	1	8120521	12/05/08	12/12/08	EPA 8082	
Aroclor 1221	ND	2.48	10.6	"	"	"	"	"	"	
Aroclor 1232	ND	2.48	10.6	"	"	"	"	"	"	
Aroclor 1242	ND	2.48	10.6	"	"	"	"	"	"	
Aroclor 1248	ND	2.48	10.6	"	"	"	"	"	"	
Aroclor 1254	66.3	2.48	10.6	"	"	"	"	"	"	
Aroclor 1260	ND	2.48	10.6	"	"	"	"	"	"	
Total Aroclors	66.3	2.48	10.6	"	"	"	"	"	"	
<i>Surrogate: TCMX</i>										
		66 %	26-146			"	"	"	"	
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Aroclor 1016	ND	1.25	5.33	ug/kg dry	1	8120521	12/05/08	12/12/08	EPA 8082	
Aroclor 1221	ND	1.25	5.33	"	"	"	"	"	"	
Aroclor 1232	ND	1.25	5.33	"	"	"	"	"	"	
Aroclor 1242	ND	1.25	5.33	"	"	"	"	"	"	
Aroclor 1248	ND	1.25	5.33	"	"	"	"	"	"	
Aroclor 1254	ND	1.25	5.33	"	"	"	"	"	"	
Aroclor 1260	ND	1.25	5.33	"	"	"	"	"	"	
Total Aroclors	ND	1.25	5.33	"	"	"	"	"	"	
<i>Surrogate: TCMX</i>										
		70 %	26-146			"	"	"	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
Acenaphthene	97.4	5.74	15.9	ug/kg dry	1	8120430	12/05/08	12/12/08	GC/MS SIMS	
Acenaphthylene	9.25	7.46	15.9	"	"	"	"	"	"	J
Anthracene	158	10.0	15.9	"	"	"	"	"	"	
Benzo (a) anthracene	333	10.6	15.9	"	"	"	"	"	"	
Benzo (b) fluoranthene	329	14.2	15.9	"	"	"	"	"	"	
Benzo (k) fluoranthene	131	10.9	15.9	"	"	"	"	"	"	
Benzo (g,h,i) perylene	33.8	15.5	15.9	"	"	"	"	"	"	
Benzo (a) pyrene	231	11.8	15.9	"	"	"	"	"	"	
Chrysene	549	6.32	15.9	"	"	"	"	"	"	
Dibenz (a,h) anthracene	25.0	14.6	15.9	"	"	"	"	"	"	
Fluoranthene	753	9.19	15.9	"	"	"	"	"	"	
Fluorene	77.5	7.46	15.9	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	58.4	15.9	15.9	"	"	"	"	"	"	
Naphthalene	106	3.05	15.9	"	"	"	"	"	"	
Phenanthrene	282	6.68	15.9	"	"	"	"	"	"	
Pyrene	1180	9.70	15.9	"	"	"	"	"	"	
Total PAHs	4350	15.9	15.9	"	"	"	"	"	"	
Surrogate: Nitrobenzene-d5	42 %		23-120			"	"	"	"	
Surrogate: 2-Fluorobiphenyl	55 %		30-115			"	"	"	"	
Surrogate: Terphenyl-dl4	64 %		18-137			"	"	"	"	
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Acenaphthene	ND	5.95	16.5	ug/kg dry	1	8120430	12/05/08	12/12/08	GC/MS SIMS	
Acenaphthylene	ND	7.74	16.5	"	"	"	"	"	"	
Anthracene	30.5	10.4	16.5	"	"	"	"	"	"	
Benzo (a) anthracene	81.3	11.0	16.5	"	"	"	"	"	"	
Benzo (b) fluoranthene	107	14.7	16.5	"	"	"	"	"	"	
Benzo (k) fluoranthene	43.1	11.3	16.5	"	"	"	"	"	"	
Benzo (g,h,i) perylene	17.8	16.1	16.5	"	"	"	"	"	"	
Benzo (a) pyrene	90.1	12.2	16.5	"	"	"	"	"	"	
Chrysene	163	6.55	16.5	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	15.2	16.5	"	"	"	"	"	"	
Fluoranthene	102	9.52	16.5	"	"	"	"	"	"	
Fluorene	9.07	7.74	16.5	"	"	"	"	"	"	J
Indeno (1,2,3-cd) pyrene	22.0	16.5	16.5	"	"	"	"	"	"	
Naphthalene	14.6	3.16	16.5	"	"	"	"	"	"	J
Phenanthrene	32.5	6.93	16.5	"	"	"	"	"	"	
Pyrene	197	10.0	16.5	"	"	"	"	"	"	
Total PAHs	909	16.5	16.5	"	"	"	"	"	"	
Surrogate: Nitrobenzene-d5	43 %		23-120			"	"	"	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Surrogate: 2-Fluorobiphenyl	53 %		30-115			8120430	12/05/08	12/12/08	GC/MS SIMS	
Surrogate: Terphenyl-dl4	72 %		18-137			"	"	"	"	
LRT-S01-03 (0812170-03) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
Acenaphthene	95.0	6.29	17.5	ug/kg dry	1	8120430	12/05/08	12/12/08	GC/MS SIMS	
Acenaphthylene	ND	8.18	17.5	"	"	"	"	"	"	
Anthracene	100	11.0	17.5	"	"	"	"	"	"	
Benzo (a) anthracene	72.8	11.7	17.5	"	"	"	"	"	"	
Benzo (b) fluoranthene	80.6	15.5	17.5	"	"	"	"	"	"	
Benzo (k) fluoranthene	32.5	12.0	17.5	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	17.0	17.5	"	"	"	"	"	"	
Benzo (a) pyrene	62.2	12.9	17.5	"	"	"	"	"	"	
Chrysene	112	6.92	17.5	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	16.0	17.5	"	"	"	"	"	"	
Fluoranthene	256	10.1	17.5	"	"	"	"	"	"	
Fluorene	75.5	8.18	17.5	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	17.5	17.5	"	"	"	"	"	"	
Naphthalene	87.0	3.34	17.5	"	"	"	"	"	"	
Phenanthrene	170	7.33	17.5	"	"	"	"	"	"	
Pyrene	261	10.6	17.5	"	"	"	"	"	"	
Total PAHs	1410	17.5	17.5	"	"	"	"	"	"	
Surrogate: Nitrobenzene-d5	43 %		23-120			"	"	"	"	
Surrogate: 2-Fluorobiphenyl	54 %		30-115			"	"	"	"	
Surrogate: Terphenyl-dl4	61 %		18-137			"	"	"	"	

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EMA Log #: 0812170

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Acenaphthene	ND	9.55	26.5	ug/kg dry	1	8120430	12/05/08	12/12/08	GC/MS SIMS	
Acenaphthylene	ND	12.4	26.5	"	"	"	"	"	"	
Anthracene	ND	16.7	26.5	"	"	"	"	"	"	
Benzo (a) anthracene	29.9	17.7	26.5	"	"	"	"	"	"	
Benzo (b) fluoranthene	43.8	23.6	26.5	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	18.1	26.5	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	25.8	26.5	"	"	"	"	"	"	
Benzo (a) pyrene	35.3	19.6	26.5	"	"	"	"	"	"	
Chrysene	59.4	10.5	26.5	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	24.4	26.5	"	"	"	"	"	"	
Fluoranthene	76.8	15.3	26.5	"	"	"	"	"	"	
Fluorene	ND	12.4	26.5	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	26.5	26.5	"	"	"	"	"	"	
Naphthalene	8.78	5.07	26.5	"	"	"	"	"	"	J
Phenanthrene	21.3	11.1	26.5	"	"	"	"	"	"	J
Pyrene	120	16.1	26.5	"	"	"	"	"	"	
Total PAHs	396	26.5	26.5	"	"	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5</i>		47 %	23-120			"	"	"	"	
<i>Surrogate: 2-Fluorobiphenyl</i>		57 %	30-115			"	"	"	"	
<i>Surrogate: Terphenyl-d14</i>		56 %	18-137			"	"	"	"	
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Acenaphthene	21.3	4.80	13.3	ug/kg dry	1	8120430	12/05/08	12/12/08	GC/MS SIMS	
Acenaphthylene	ND	6.24	13.3	"	"	"	"	"	"	
Anthracene	17.6	8.40	13.3	"	"	"	"	"	"	
Benzo (a) anthracene	18.1	8.89	13.3	"	"	"	"	"	"	
Benzo (b) fluoranthene	24.1	11.9	13.3	"	"	"	"	"	"	
Benzo (k) fluoranthene	10.5	9.12	13.3	"	"	"	"	"	"	J
Benzo (g,h,i) perylene	ND	13.0	13.3	"	"	"	"	"	"	
Benzo (a) pyrene	17.5	9.84	13.3	"	"	"	"	"	"	
Chrysene	29.8	5.28	13.3	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	12.2	13.3	"	"	"	"	"	"	
Fluoranthene	57.2	7.68	13.3	"	"	"	"	"	"	
Fluorene	17.8	6.24	13.3	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	13.3	13.3	"	"	"	"	"	"	
Naphthalene	41.5	2.55	13.3	"	"	"	"	"	"	
Phenanthrene	51.1	5.59	13.3	"	"	"	"	"	"	
Pyrene	98.7	8.11	13.3	"	"	"	"	"	"	
Total PAHs	405	13.3	13.3	"	"	"	"	"	"	
<i>Surrogate: Nitrobenzene-d5</i>		35 %	23-120			"	"	"	"	
<i>Surrogate: 2-Fluorobiphenyl</i>		50 %	30-115			"	"	"	"	

EnviroMatrix

**Analytical, Inc.**

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
Surrogate: Terphenyl-d14	67 %		18-137			8120430	12/05/08	12/12/08	GC/MS SIMS	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Conventional Chemistry Parameters by Standard/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
% Solids	62.7	0.1	0.1	%	1	8121226	12/12/08	12/15/08	SM 2540 G	
LRT-S01-02 (0812170-02) Sediment Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
% Solids	60.5	0.1	0.1	%	1	8121226	12/12/08	12/15/08	SM 2540 G	
LRT-S01-03 (0812170-03) Sediment Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
% Solids	57.2	0.1	0.1	%	1	8121226	12/12/08	12/15/08	SM 2540 G	
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
% Solids	37.7	0.1	0.1	%	1	8121226	12/12/08	12/15/08	SM 2540 G	
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38										
% Solids	75.0	0.1	0.1	%	1	8121226	12/12/08	12/15/08	SM 2540 G	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organotin Compounds by GC - FPD

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-01 (0812170-01) Sediment										GC-05
Sampled: 12/01/08 14:00 Received: 12/04/08 10:38										
Tetrabutyltin	ND	1.42	1.59	ug/kg dry	1	8120429	12/04/08	12/12/08	GC - FPD	
Tributyltin	ND	1.58	1.59	"	"	"	"	"	"	
Dibutyltin	ND	1.83	3.19	"	"	"	"	"	"	
Monobutyltin	ND	0.88	3.19	"	"	"	"	"	"	
Total Organotins	ND	1.42	1.59	"	"	"	"	"	"	
Surrogate: Triphenyltin		93 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		4040 %	65-140			"	"	"	"	S-02, S-04
LRT-S01-02 (0812170-02) Sediment										GC-05
Sampled: 12/01/08 12:30 Received: 12/04/08 10:38										
Tetrabutyltin	ND	1.47	1.65	ug/kg dry	1	8120429	12/04/08	12/12/08	GC - FPD	
Tributyltin	ND	1.64	1.65	"	"	"	"	"	"	
Dibutyltin	ND	1.90	3.31	"	"	"	"	"	"	
Monobutyltin	ND	0.91	3.31	"	"	"	"	"	"	
Total Organotins	ND	1.47	1.65	"	"	"	"	"	"	
Surrogate: Triphenyltin		105 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		1350 %	65-140			"	"	"	"	S-02, S-04
LRT-S01-03 (0812170-03) Sediment										GC-05
Sampled: 12/01/08 11:50 Received: 12/04/08 10:38										
Tetrabutyltin	ND	1.56	1.75	ug/kg dry	1	8120429	12/04/08	12/12/08	GC - FPD	
Tributyltin	ND	1.73	1.75	"	"	"	"	"	"	
Dibutyltin	ND	2.01	3.50	"	"	"	"	"	"	
Monobutyltin	ND	0.96	3.50	"	"	"	"	"	"	
Total Organotins	ND	1.56	1.75	"	"	"	"	"	"	
Surrogate: Triphenyltin		106 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		1570 %	65-140			"	"	"	"	S-02, S-04

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organotin Compounds by GC - FPD

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-04 (0812170-04) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38								GC-05		
Tetrabutyltin	ND	2.36	2.65	ug/kg dry	1	8120429	12/04/08	12/12/08	GC - FPD	
Tributyltin	ND	2.63	2.65	"	"	"	"	"	"	
Dibutyltin	ND	3.05	5.31	"	"	"	"	"	"	
Monobutyltin	ND	1.46	5.31	"	"	"	"	"	"	
Total Organotins	ND	2.36	2.65	"	"	"	"	"	"	
Surrogate: Tripentyltin		99 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		554 %	65-140			"	"	"	"	S-02, S-04
LRT-S01-Z Layer Comp (0812170-05) Sediment Sampled: 12/01/08 10:45 Received: 12/04/08 10:38								GC-05		
Tetrabutyltin	ND	1.19	1.33	ug/kg dry	1	8120429	12/04/08	12/12/08	GC - FPD	
Tributyltin	ND	1.32	1.33	"	"	"	"	"	"	
Dibutyltin	ND	1.53	2.67	"	"	"	"	"	"	
Monobutyltin	ND	0.73	2.67	"	"	"	"	"	"	
Total Organotins	ND	1.19	1.33	"	"	"	"	"	"	
Surrogate: Tripentyltin		111 %	65-132			"	"	"	"	
Surrogate: Tri-n-propyltin		134 %	65-140			"	"	"	"	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8121609

Blank (8121609-BLK1)

Prepared & Analyzed: 12/16/08

Mercury ND 0.010 0.010 mg/kg wet

LCS (8121609-BS1)

Prepared & Analyzed: 12/16/08

Mercury 0.200 0.010 0.010 mg/kg wet 0.200 100 75-125

LCS Dup (8121609-BSD1)

Prepared & Analyzed: 12/16/08

Mercury 0.200 0.010 0.010 mg/kg wet 0.200 100 75-125 0 20

Duplicate (8121609-DUP1)

Source: 0812170-02

Prepared & Analyzed: 12/16/08

Mercury 0.207 0.017 0.017 mg/kg dry 0.241 15 20

Matrix Spike (8121609-MS1)

Source: 0812170-02

Prepared & Analyzed: 12/16/08

Mercury 0.583 0.017 0.017 mg/kg dry 0.331 0.241 104 75-125

Matrix Spike Dup (8121609-MSD1)

Source: 0812170-02

Prepared & Analyzed: 12/16/08

Mercury 0.615 0.017 0.017 mg/kg dry 0.331 0.241 113 75-125 5 20

Batch 8121914

Blank (8121914-BLK1)

Prepared & Analyzed: 12/19/08

Nickel ND 0.200 1.00 mg/kg wet

Silver ND 0.100 0.100 "

Cadmium ND 0.100 0.100 "

Chromium ND 0.400 1.00 "

Arsenic ND 0.200 0.500 "

Copper ND 0.400 0.500 "

Lead ND 0.100 0.500 "

Selenium ND 0.00400 0.0500 "

Zinc ND 2.20 5.00 "

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8121914

LCS (8121914-BS1)

Prepared & Analyzed: 12/19/08

Zinc	8.28	2.20	5.00	mg/kg wet	10.0		83	75-125			
Nickel	9.63	0.200	1.00	"	10.0		96	75-125			
Arsenic	8.63	0.200	0.500	"	10.0		86	75-125			
Chromium	10.0	0.400	1.00	"	10.0		100	75-125			
Copper	9.49	0.400	0.500	"	10.0		95	75-125			
Lead	10.6	0.100	0.500	"	10.0		106	75-125			
Silver	9.48	0.100	0.100	"	10.0		95	75-125			
Cadmium	8.83	0.100	0.100	"	10.0		88	75-125			
Selenium	8.30	0.00400	0.0500	"	10.0		83	75-125			

LCS Dup (8121914-BSD1)

Prepared & Analyzed: 12/19/08

Chromium	9.90	0.400	1.00	mg/kg wet	10.0		99	75-125	1	20	
Selenium	8.05	0.00400	0.0500	"	10.0		81	75-125	3	20	
Silver	9.81	0.100	0.100	"	10.0		98	75-125	3	20	
Arsenic	8.59	0.200	0.500	"	10.0		86	75-125	0.5	20	
Lead	10.4	0.100	0.500	"	10.0		104	75-125	2	20	
Nickel	9.55	0.200	1.00	"	10.0		96	75-125	0.8	20	
Cadmium	8.83	0.100	0.100	"	10.0		88	75-125	0.06	20	
Zinc	8.29	2.20	5.00	"	10.0		83	75-125	0.02	20	
Copper	9.49	0.400	0.500	"	10.0		95	75-125	0.06	20	

Duplicate (8121914-DUP1)

Source: 0812170-05

Prepared & Analyzed: 12/19/08

Nickel	48.3	0.267	1.33	mg/kg dry		47.2			2	20	
Arsenic	4.04	0.267	0.667	"		2.62			43	20	QR-02
Cadmium	0.392	0.133	0.133	"		0.669			52	20	QR-02
Chromium	51.1	0.533	1.33	"		47.4			8	20	
Selenium	0.184	0.00533	0.0667	"		0.201			9	20	
Silver	ND	0.133	0.133	"		ND				20	
Zinc	67.7	2.93	6.67	"		60.7			11	20	
Copper	22.0	0.533	0.667	"		93.4			124	20	QR-02
Lead	11.2	0.133	0.667	"		19.8			55	20	QR-02

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8121914											
Matrix Spike (8121914-MS1)			Source: 0812170-05			Prepared & Analyzed: 12/19/08					
Zinc	84.6	2.93	6.67	mg/kg dry	13.3	60.7	179	75-125			QM-06
Nickel	61.1	0.267	1.33	"	13.3	47.2	104	75-125			
Chromium	65.9	0.533	1.33	"	13.3	47.4	139	75-125			QM-06
Cadmium	12.0	0.133	0.133	"	13.3	0.669	85	75-125			
Silver	12.0	0.133	0.133	"	13.3	ND	90	75-125			
Arsenic	13.4	0.267	0.667	"	13.3	2.62	81	75-125			
Copper	32.7	0.533	0.667	"	13.3	93.4	NR	75-125			QM-06
Selenium	11.1	0.00533	0.0667	"	13.3	0.201	82	75-125			
Lead	24.3	0.133	0.667	"	13.3	19.8	34	75-125			QM-06
Matrix Spike Dup (8121914-MSD1)			Source: 0812170-05			Prepared & Analyzed: 12/19/08					
Nickel	65.5	0.267	1.33	mg/kg dry	13.3	47.2	137	75-125	7	20	QM-06
Selenium	11.7	0.00533	0.0667	"	13.3	0.201	86	75-125	5	20	
Cadmium	11.7	0.133	0.133	"	13.3	0.669	82	75-125	3	20	
Zinc	76.6	2.93	6.67	"	13.3	60.7	119	75-125	10	20	
Arsenic	14.9	0.267	0.667	"	13.3	2.62	92	75-125	11	20	
Silver	11.8	0.133	0.133	"	13.3	ND	89	75-125	1	20	
Lead	22.5	0.133	0.667	"	13.3	19.8	21	75-125	7	20	QM-06
Copper	33.2	0.533	0.667	"	13.3	93.4	NR	75-125	2	20	QM-06
Chromium	63.7	0.533	1.33	"	13.3	47.4	123	75-125	3	20	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Sediment Chemistry Methodologies (reported in dry weight) - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120909											
Blank (8120909-BLK1)					Prepared & Analyzed: 12/09/08						
Total Organic Carbon	ND	0.010	0.010	% dry							
LCS (8120909-BS1)					Prepared & Analyzed: 12/09/08						
Total Organic Carbon	0.053	0.010	0.010	% dry	0.0500		105	80-120			
LCS Dup (8120909-BSD1)					Prepared & Analyzed: 12/09/08						
Total Organic Carbon	0.050	0.010	0.010	% dry	0.0500		100	80-120	5	20	
Duplicate (8120909-DUP1)					Source: 0812170-01		Prepared & Analyzed: 12/09/08				
Total Organic Carbon	1.95	0.010	0.010	% dry		1.86			5	20	
Matrix Spike (8120909-MS1)					Source: 0812170-01		Prepared & Analyzed: 12/09/08				
Total Organic Carbon	2.85	0.010	0.010	% dry	0.0500	1.86	NR	80-120			QM-4X
Matrix Spike Dup (8120909-MSD1)					Source: 0812170-01		Prepared & Analyzed: 12/09/08				
Total Organic Carbon	1.92	0.010	0.010	% dry	0.0500	1.86	136	80-120	39	20	QM-4X

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120521											
Blank (8120521-BLK1)						Prepared: 12/05/08 Analyzed: 12/12/08					
Aldrin	ND	0.10	0.40	ug/kg wet							
alpha-BHC	ND	0.05	0.40	"							
beta-BHC	ND	0.09	0.40	"							
gamma-BHC (Lindane)	ND	0.07	0.40	"							
delta-BHC	ND	0.08	0.40	"							
Total BHCs	ND	0.05	0.40	"							
Chlordane (Total)	ND	0.95	1.02	"							
2,4'-DDD	ND	0.24	0.40	"							
4,4'-DDD	ND	0.10	0.40	"							
2,4'-DDE	ND	0.22	0.40	"							
4,4'-DDE	ND	0.09	0.40	"							
2,4'-DDT	ND	0.40	0.40	"							
4,4'-DDT	ND	0.06	0.40	"							
Total DDT	ND	0.06	0.40	"							
Dieldrin	ND	0.09	0.40	"							
Endosulfan I	ND	0.08	0.40	"							
Endosulfan II	ND	0.15	0.40	"							
Endosulfan sulfate	ND	0.10	0.40	"							
Endrin	ND	0.10	0.40	"							
Endrin aldehyde	ND	0.06	0.40	"							
Heptachlor	ND	0.14	0.40	"							
Heptachlor epoxide	ND	0.14	0.40	"							
Methoxychlor	ND	0.15	0.80	"							
Toxaphene	ND	3.52	4.96	"							
Surrogate: TCMX	5.94			"	6.67		89	26-146			
LCS (8120521-BS1)						Prepared: 12/05/08 Analyzed: 12/12/08					
Aldrin	16.0	0.26	1.00	ug/kg wet	16.7		96	42-122			
gamma-BHC (Lindane)	15.8	0.18	1.00	"	16.7		95	32-127			
4,4'-DDT	18.0	0.16	1.00	"	16.7		108	25-160			
Dieldrin	16.7	0.24	1.00	"	16.7		100	36-146			
Endrin	17.6	0.24	1.00	"	16.7		106	30-147			
Heptachlor	17.8	0.36	1.00	"	16.7		107	34-111			
Surrogate: TCMX	13.9			"	16.7		83	26-146			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8120521

LCS Dup (8120521-BSD1)

Prepared: 12/05/08 Analyzed: 12/12/08

Aldrin	17.1	0.26	1.00	ug/kg wet	16.7		102	42-122	6	30	
gamma-BHC (Lindane)	17.0	0.18	1.00	"	16.7		102	32-127	7	30	
4,4'-DDT	18.8	0.16	1.00	"	16.7		113	25-160	4	30	
Dieldrin	18.2	0.24	1.00	"	16.7		109	36-146	9	30	
Endrin	18.8	0.24	1.00	"	16.7		113	30-147	7	30	
Heptachlor	17.3	0.36	1.00	"	16.7		104	34-111	3	30	
Surrogate: TCMX	14.5			"	16.7		87	26-146			

Duplicate (8120521-DUP1)

Source: 0812170-01

Prepared: 12/05/08 Analyzed: 12/16/08

Aldrin	ND	0.16	0.64	ug/kg dry		ND				30	
alpha-BHC	ND	0.09	0.64	"		ND				30	
beta-BHC	ND	0.14	0.64	"		ND				30	
gamma-BHC (Lindane)	ND	0.11	0.64	"		ND				30	
delta-BHC	ND	0.13	0.64	"		ND				30	
Total BHCs	ND	0.09	0.64	"		ND				30	
Chlordane (Total)	ND	1.52	1.63	"		ND				30	
2,4'-DDD	142	19.5	31.9	"		72.7			64	30	QR-02
4,4'-DDD	674	7.81	31.9	"		302			76	30	QR-02
2,4'-DDE	ND	17.2	31.9	"		ND				30	
4,4'-DDE	132	7.50	31.9	"		116			14	30	
2,4'-DDT	ND	31.9	31.9	"		ND				30	
4,4'-DDT	336	5.10	31.9	"		41.5			156	30	QR-02
Total DDT	1280	5.10	31.9	"		532			83	30	QR-02
Dieldrin	42.3	7.50	31.9	"		33.5			23	30	
Endosulfan I	ND	0.13	0.64	"		ND				30	
Endosulfan II	ND	0.24	0.64	"		ND				30	
Endosulfan sulfate	ND	0.15	0.64	"		ND				30	
Endrin	ND	0.16	0.64	"		ND				30	
Endrin aldehyde	ND	0.10	0.64	"		ND				30	
Heptachlor	ND	0.23	0.64	"		ND				30	
Heptachlor epoxide	ND	0.22	0.64	"		ND				30	
Methoxychlor	ND	0.24	1.28	"		ND				30	
Toxaphene	ND	5.61	7.91	"		ND				30	
Surrogate: TCMX	9.23			"	10.6		87	26-146			

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organochlorine Pesticides by EPA Method 8081A - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8120521

Matrix Spike (8120521-MS1) Source: 0812170-02 Prepared: 12/05/08 Analyzed: 12/17/08

Aldrin	22.1	2.11	8.26	ug/kg dry	27.5	ND	80	42-122		
gamma-BHC (Lindane)	22.1	1.45	8.26	"	27.5	ND	80	32-127		
4,4'-DDT	21.5	1.32	8.26	"	27.5	2.42	69	25-160		
Dieldrin	23.7	1.94	8.26	"	27.5	2.27	78	36-146		
Endrin	24.1	2.02	8.26	"	27.5	ND	88	30-147		
Heptachlor	24.6	2.93	8.26	"	27.5	ND	89	34-111		

Surrogate: TCMX 20.3 " 27.5 74 26-146

Matrix Spike Dup (8120521-MSD1) Source: 0812170-02 Prepared: 12/05/08 Analyzed: 12/17/08

Aldrin	22.5	2.11	8.26	ug/kg dry	27.5	ND	82	42-122	2	30
gamma-BHC (Lindane)	23.3	1.45	8.26	"	27.5	ND	85	32-127	6	30
4,4'-DDT	25.6	1.32	8.26	"	27.5	2.42	84	25-160	17	30
Dieldrin	26.7	1.94	8.26	"	27.5	2.27	89	36-146	12	30
Endrin	28.4	2.02	8.26	"	27.5	ND	103	30-147	16	30
Heptachlor	25.6	2.93	8.26	"	27.5	ND	93	34-111	4	30

Surrogate: TCMX 23.6 " 27.5 86 26-146

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8120521

Blank (8120521-BLK1)

Prepared: 12/05/08 Analyzed: 12/12/08

Aroclor 1016	ND	0.94	4.00	ug/kg wet						
Aroclor 1221	ND	0.94	4.00	"						
Aroclor 1232	ND	0.94	4.00	"						
Aroclor 1242	ND	0.94	4.00	"						
Aroclor 1248	ND	0.94	4.00	"						
Aroclor 1254	ND	0.94	4.00	"						
Aroclor 1260	ND	0.94	4.00	"						
Total Aroclors	ND	0.94	4.00	"						

Surrogate: TCMX 5.94 " 6.67 89 26-146

LCS (8120521-BS2)

Prepared: 12/05/08 Analyzed: 12/12/08

Aroclor 1260	135	2.34	10.0	ug/kg wet	167		81	8-127		
Surrogate: TCMX	12.8			"	16.7		77	26-146		

LCS Dup (8120521-BSD2)

Prepared: 12/05/08 Analyzed: 12/12/08

Aroclor 1260	130	2.34	10.0	ug/kg wet	167		78	8-127	4	30
Surrogate: TCMX	12.1			"	16.7		73	26-146		

Duplicate (8120521-DUP1)

Source: 0812170-01

Prepared: 12/05/08 Analyzed: 12/12/08

Aroclor 1016	ND	1.49	6.38	ug/kg dry		ND				30
Aroclor 1221	ND	1.49	6.38	"		ND				30
Aroclor 1232	ND	1.49	6.38	"		ND				30
Aroclor 1242	ND	1.49	6.38	"		ND				30
Aroclor 1248	ND	1.49	6.38	"		ND				30
Aroclor 1254	ND	1.49	6.38	"		ND				30
Aroclor 1260	ND	1.49	6.38	"		ND				30
Total Aroclors	ND	1.49	6.38	"		ND				30

Surrogate: TCMX 9.23 " 10.6 87 26-146

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120521											
Matrix Spike (8120521-MS2)			Source: 0812170-04		Prepared: 12/05/08		Analyzed: 12/17/08				
Aroclor 1260	462	24.8	106	ug/kg dry	442	ND	104	8-127			
Surrogate: TCMX	27.3			"	44.2		62	26-146			
Matrix Spike Dup (8120521-MSD2)			Source: 0812170-04		Prepared: 12/05/08		Analyzed: 12/17/08				
Aroclor 1260	561	24.8	106	ug/kg dry	442	ND	127	8-127	20	30	
Surrogate: TCMX	28.4			"	44.2		64	26-146			
Batch 9011206											
Blank (9011206-BLK1)			Prepared: 01/12/09 Analyzed: 01/14/09								
Aroclor 1016	ND	0.94	4.00	ug/kg wet							
Aroclor 1221	ND	0.94	4.00	"							
Aroclor 1232	ND	0.94	4.00	"							
Aroclor 1242	ND	0.94	4.00	"							
Aroclor 1248	ND	0.94	4.00	"							
Aroclor 1254	ND	0.94	4.00	"							
Aroclor 1260	ND	0.94	4.00	"							
Total Aroclors	ND	0.94	4.00	"							
Surrogate: TCMX	4.84			"	6.67		73	26-146			
LCS (9011206-BS1)			Prepared: 01/12/09 Analyzed: 01/14/09								
Aroclor 1260	154	2.34	10.0	ug/kg wet	167		92	8-127			
Surrogate: TCMX	14.2			"	16.7		85	26-146			
LCS Dup (9011206-BSD1)			Prepared: 01/12/09 Analyzed: 01/14/09								
Aroclor 1260	156	2.34	10.0	ug/kg wet	167		94	8-127	1	30	
Surrogate: TCMX	13.9			"	16.7		83	26-146			

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 9011206

Duplicate (9011206-DUP1)

Source: 0901172-01

Prepared: 01/12/09

Analyzed: 01/14/09

Aroclor 1016	ND	17.9	76.6	ug/kg dry		ND				30	
Aroclor 1221	ND	17.9	76.6	"		ND				30	
Aroclor 1232	ND	17.9	76.6	"		ND				30	
Aroclor 1242	ND	17.9	76.6	"		ND				30	
Aroclor 1248	ND	17.9	76.6	"		ND				30	
Aroclor 1254	203	17.9	76.6	"		249			20	30	
Aroclor 1260	ND	17.9	76.6	"		ND				30	
Total Aroclors	203	17.9	76.6	"		249			20	30	

Surrogate: TCMX

8.30

"

12.8

65

26-146

Duplicate (9011206-DUP2)

Source: 0812170-03RE2

Prepared: 01/12/09

Analyzed: 01/14/09

Aroclor 1016	ND	16.4	69.9	ug/kg dry		ND				30	
Aroclor 1221	ND	16.4	69.9	"		ND				30	
Aroclor 1232	ND	16.4	69.9	"		ND				30	
Aroclor 1242	ND	16.4	69.9	"		ND				30	
Aroclor 1248	ND	16.4	69.9	"		ND				30	
Aroclor 1254	338	16.4	69.9	"		448			28	30	
Aroclor 1260	ND	16.4	69.9	"		ND				30	
Total Aroclors	338	16.4	69.9	"		448			28	30	

Surrogate: TCMX

8.92

"

11.7

76

26-146

Matrix Spike (9011206-MS1)

Source: 0901172-01

Prepared: 01/12/09

Analyzed: 01/14/09

Aroclor 1260	389	22.4	95.8	ug/kg dry	319	ND	122	8-127			
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Surrogate: TCMX

32.3

"

31.9

101

26-146

Matrix Spike Dup (9011206-MSD1)

Source: 0901172-01

Prepared: 01/12/09

Analyzed: 01/14/09

Aroclor 1260	314	22.4	95.8	ug/kg dry	319	ND	98	8-127	21	30	
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Surrogate: TCMX

32.9

"

31.9

103

26-146

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120430											
Blank (8120430-BLK1)											
						Prepared: 12/05/08 Analyzed: 12/12/08					
Acenaphthene	ND	3.60	10.0	ug/kg wet							
Acenaphthylene	ND	4.68	10.0	"							
Anthracene	ND	6.30	10.0	"							
Benzo (a) anthracene	ND	6.67	10.0	"							
Benzo (b) fluoranthene	ND	8.89	10.0	"							
Benzo (k) fluoranthene	ND	6.84	10.0	"							
Benzo (g,h,i) perylene	ND	9.72	10.0	"							
Benzo (a) pyrene	ND	7.38	10.0	"							
Chrysene	ND	3.96	10.0	"							
Dibenz (a,h) anthracene	ND	9.18	10.0	"							
Fluoranthene	ND	5.76	10.0	"							
Fluorene	ND	4.68	10.0	"							
Indeno (1,2,3-cd) pyrene	ND	10.0	10.0	"							
Naphthalene	ND	1.91	10.0	"							
Phenanthrene	ND	4.19	10.0	"							
Pyrene	ND	6.08	10.0	"							
Total PAHs	ND	10.0	10.0	"							
Surrogate: Nitrobenzene-d5	186			"	231		80	23-120			
Surrogate: 2-Fluorobiphenyl	179			"	231		77	30-115			
Surrogate: Terphenyl-d14	191			"	231		83	18-137			
LCS (8120430-BS1)											
						Prepared: 12/05/08 Analyzed: 12/12/08					
Acenaphthene	207	3.60	10.0	ug/kg wet	231		90	47-145			
Acenaphthylene	212	4.68	10.0	"	231		91	33-145			
Anthracene	200	6.30	10.0	"	231		87	27-133			
Benzo (a) anthracene	220	6.67	10.0	"	231		95	33-143			
Benzo (b) fluoranthene	221	8.89	10.0	"	231		95	24-159			
Benzo (k) fluoranthene	233	6.84	10.0	"	231		101	11-162			
Benzo (g,h,i) perylene	154	9.72	10.0	"	231		67	0-219			
Benzo (a) pyrene	228	7.38	10.0	"	231		99	17-163			
Chrysene	269	3.96	10.0	"	231		116	17-168			
Dibenz (a,h) anthracene	226	9.18	10.0	"	231		98	0-227			
Fluoranthene	209	5.76	10.0	"	231		90	26-137			
Fluorene	207	4.68	10.0	"	231		90	59-121			
Indeno (1,2,3-cd) pyrene	228	10.0	10.0	"	231		98	0-171			
Naphthalene	200	1.91	10.0	"	231		86	21-133			
Phenanthrene	202	4.19	10.0	"	231		87	54-120			
Pyrene	216	6.08	10.0	"	231		93	52-152			
Surrogate: Nitrobenzene-d5	178			"	231		77	23-120			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8120430

LCS (8120430-BS1)

Prepared: 12/05/08 Analyzed: 12/12/08

Surrogate: 2-Fluorobiphenyl	185			ug/kg wet	231		80	30-115			
Surrogate: Terphenyl-d14	194			"	231		84	18-137			

LCS Dup (8120430-BSD1)

Prepared: 12/05/08 Analyzed: 12/12/08

Acenaphthene	203	3.60	10.0	ug/kg wet	231		88	47-145	2	30	
Acenaphthylene	208	4.68	10.0	"	231		90	33-145	2	30	
Anthracene	197	6.30	10.0	"	231		85	27-133	2	30	
Benzo (a) anthracene	211	6.67	10.0	"	231		91	33-143	5	30	
Benzo (b) fluoranthene	203	8.89	10.0	"	231		88	24-159	8	30	
Benzo (k) fluoranthene	223	6.84	10.0	"	231		96	11-162	5	30	
Benzo (g,h,i) perylene	137	9.72	10.0	"	231		59	0-219	12	30	
Benzo (a) pyrene	213	7.38	10.0	"	231		92	17-163	7	30	
Chrysene	261	3.96	10.0	"	231		113	17-168	3	30	
Dibenz (a,h) anthracene	212	9.18	10.0	"	231		91	0-227	7	30	
Fluoranthene	207	5.76	10.0	"	231		89	26-137	1	30	
Fluorene	204	4.68	10.0	"	231		88	59-121	2	30	
Indeno (1,2,3-cd) pyrene	212	10.0	10.0	"	231		91	0-171	7	30	
Naphthalene	195	1.91	10.0	"	231		84	21-133	2	30	
Phenanthrene	197	4.19	10.0	"	231		85	54-120	3	30	
Pyrene	210	6.08	10.0	"	231		91	52-152	3	30	
Surrogate: Nitrobenzene-d5	174			"	231		75	23-120			
Surrogate: 2-Fluorobiphenyl	178			"	231		77	30-115			
Surrogate: Terphenyl-d14	189			"	231		82	18-137			

Duplicate (8120430-DUP1)

Source: 0812170-01

Prepared: 12/05/08 Analyzed: 12/12/08

Acenaphthene	204	5.74	15.9	ug/kg dry		97.4			71	30	QR-02
Acenaphthylene	21.8	7.46	15.9	"		9.25			81	30	QR-02
Anthracene	244	10.0	15.9	"		158			43	30	QR-02
Benzo (a) anthracene	668	10.6	15.9	"		333			67	30	QR-02
Benzo (b) fluoranthene	902	14.2	15.9	"		329			93	30	QR-02
Benzo (k) fluoranthene	288	10.9	15.9	"		131			75	30	QR-02
Benzo (g,h,i) perylene	105	15.5	15.9	"		33.8			102	30	QR-02
Benzo (a) pyrene	569	11.8	15.9	"		231			85	30	QR-02
Chrysene	1290	6.32	15.9	"		549			81	30	QR-02
Dibenz (a,h) anthracene	63.1	14.6	15.9	"		25.0			87	30	QR-02
Fluoranthene	2400	9.19	15.9	"		753			104	30	QR-02
Fluorene	165	7.46	15.9	"		77.5			72	30	QR-02
Indeno (1,2,3-cd) pyrene	163	15.9	15.9	"		58.4			95	30	QR-02
Naphthalene	123	3.05	15.9	"		106			15	30	
Phenanthrene	1590	6.68	15.9	"		282			140	30	QR-02
Pyrene	3300	9.70	15.9	"		1180			95	30	QR-02

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120430											
Duplicate (8120430-DUP1)			Source: 0812170-01		Prepared: 12/05/08		Analyzed: 12/12/08				
Total PAHs	12100	15.9	15.9	ug/kg dry		4350			94	30	QR-02
Surrogate: Nitrobenzene-d5	214			"	369		58	23-120			
Surrogate: 2-Fluorobiphenyl	229			"	369		62	30-115			
Surrogate: Terphenyl-d14	297			"	369		80	18-137			
Matrix Spike (8120430-MS1)			Source: 0812170-01		Prepared: 12/05/08		Analyzed: 12/12/08				
Acenaphthene	318	5.74	15.9	ug/kg dry	369	97.4	60	47-145			
Acenaphthylene	245	7.46	15.9	"	369	9.25	64	33-145			
Anthracene	338	10.0	15.9	"	369	158	49	27-133			
Benzo (a) anthracene	466	10.6	15.9	"	369	333	36	33-143			
Benzo (b) fluoranthene	492	14.2	15.9	"	369	329	44	24-159			
Benzo (k) fluoranthene	379	10.9	15.9	"	369	131	67	11-162			
Benzo (g,h,i) perylene	218	15.5	15.9	"	369	33.8	50	0-219			
Benzo (a) pyrene	114	11.8	15.9	"	369	231	NR	17-163			QM-08
Chrysene	620	6.32	15.9	"	369	549	19	17-168			
Dibenz (a,h) anthracene	278	14.6	15.9	"	369	25.0	69	0-227			
Fluoranthene	668	9.19	15.9	"	369	753	NR	26-137			QM-08
Fluorene	287	7.46	15.9	"	369	77.5	57	59-121			QM-08
Indeno (1,2,3-cd) pyrene	319	15.9	15.9	"	369	58.4	71	0-171			
Naphthalene	279	3.05	15.9	"	369	106	47	21-133			
Phenanthrene	427	6.68	15.9	"	369	282	39	54-120			QM-08
Pyrene	986	9.70	15.9	"	369	1180	NR	52-152			QM-08
Surrogate: Nitrobenzene-d5	200			"	369		54	23-120			
Surrogate: 2-Fluorobiphenyl	197			"	369		53	30-115			
Surrogate: Terphenyl-d14	243			"	369		66	18-137			
Matrix Spike Dup (8120430-MSD1)			Source: 0812170-01		Prepared: 12/05/08		Analyzed: 12/12/08				
Acenaphthene	370	5.74	15.9	ug/kg dry	369	97.4	74	47-145	15	30	
Acenaphthylene	271	7.46	15.9	"	369	9.25	71	33-145	10	30	
Anthracene	357	10.0	15.9	"	369	158	54	27-133	6	30	
Benzo (a) anthracene	479	10.6	15.9	"	369	333	40	33-143	3	30	
Benzo (b) fluoranthene	562	14.2	15.9	"	369	329	63	24-159	13	30	
Benzo (k) fluoranthene	404	10.9	15.9	"	369	131	74	11-162	6	30	
Benzo (g,h,i) perylene	215	15.5	15.9	"	369	33.8	49	0-219	1	30	
Benzo (a) pyrene	507	11.8	15.9	"	369	231	75	17-163	127	30	QR-02
Chrysene	660	6.32	15.9	"	369	549	30	17-168	6	30	
Dibenz (a,h) anthracene	320	14.6	15.9	"	369	25.0	80	0-227	14	30	
Fluoranthene	748	9.19	15.9	"	369	753	NR	26-137	11	30	QM-08
Fluorene	329	7.46	15.9	"	369	77.5	68	59-121	13	30	
Indeno (1,2,3-cd) pyrene	351	15.9	15.9	"	369	58.4	79	0-171	10	30	
Naphthalene	340	3.05	15.9	"	369	106	63	21-133	20	30	

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Polynuclear Aromatic Compounds by GC/MS SIMS - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8120430

Matrix Spike Dup (8120430-MSD1)

Source: 0812170-01

Prepared: 12/05/08

Analyzed: 12/12/08

Phenanthrene	448	6.68	15.9	ug/kg dry	369	282	45	54-120	5	30	QM-08
Pyrene	1250	9.70	15.9	"	369	1180	19	52-152	23	30	QM-08
Surrogate: Nitrobenzene-d5	219			"	369		59	23-120			
Surrogate: 2-Fluorobiphenyl	227			"	369		61	30-115			
Surrogate: Terphenyl-d14	283			"	369		77	18-137			

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Conventional Chemistry Parameters by Standard/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 8121226

Duplicate (8121226-DUP1)

Source: 0812170-01

Prepared: 12/12/08 Analyzed: 12/15/08

% Solids	56.1	0.1	0.1	%		62.7			11	20	
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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organotin Compounds by GC - FPD - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120429											
Blank (8120429-BLK1)											
						Prepared: 12/04/08 Analyzed: 12/12/08					
Tetrabutyltin	ND	0.89	1.00	ug/kg wet							
Tributyltin	ND	0.99	1.00	"							
Dibutyltin	ND	1.15	2.00	"							
Monobutyltin	ND	0.55	2.00	"							
Total Organotins	ND	0.89	1.00	"							
Surrogate: Triphenyltin	27.4			"	25.0		109	65-132			
Surrogate: Tri-n-propyltin	21.8			"	25.0		87	65-140			
LCS (8120429-BS1)											
						Prepared: 12/04/08 Analyzed: 12/12/08					
Tetrabutyltin	22.8	0.89	1.00	ug/kg wet	25.0		91	75-115			
Tributyltin	24.3	0.99	1.00	"	25.0		97	58-128			
Dibutyltin	29.6	1.15	2.00	"	25.0		118	39-150			
Monobutyltin	7.89	0.55	2.00	"	25.0		32	0-140			
Surrogate: Triphenyltin	20.2			"	25.0		81	65-132			
Surrogate: Tri-n-propyltin	25.0			"	25.0		100	65-140			
LCS Dup (8120429-BSD1)											
						Prepared: 12/04/08 Analyzed: 12/12/08					
Tetrabutyltin	21.3	0.89	1.00	ug/kg wet	25.0		85	75-115	7	30	
Tributyltin	23.5	0.99	1.00	"	25.0		94	58-128	3	30	
Dibutyltin	27.7	1.15	2.00	"	25.0		111	39-150	7	30	
Monobutyltin	12.0	0.55	2.00	"	25.0		48	0-140	41	30	QL-02
Surrogate: Triphenyltin	22.8			"	25.0		91	65-132			
Surrogate: Tri-n-propyltin	24.8			"	25.0		99	65-140			
Duplicate (8120429-DUP1)											
						Source: 0812170-01 Prepared: 12/04/08 Analyzed: 12/12/08					
Tetrabutyltin	13.8	1.42	1.59	ug/kg dry		ND				30	
Tributyltin	93.0	1.58	1.59	"		ND				30	
Dibutyltin	155	1.83	3.19	"		ND				30	
Monobutyltin	ND	0.88	3.19	"		ND				30	
Total Organotins	ND	1.42	1.59	"		ND				30	
Surrogate: Triphenyltin	32.6			"	39.9		82	65-132			
Surrogate: Tri-n-propyltin	1300			"	39.9		NR	65-140			S-02, S-04

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Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Organotin Compounds by GC - FPD - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8120429											
Matrix Spike (8120429-MS1)		Source: 0812170-01			Prepared: 12/04/08		Analyzed: 12/12/08				
Tetrabutyltin	36.0	1.42	1.59	ug/kg dry	39.9	ND	90	74-115			
Tributyltin	85.2	1.58	1.59	"	39.9	ND	214	45-139			GC-60, QM-01
Dibutyltin	12.3	1.83	3.19	"	39.9	ND	31	0-165			
Monobutyltin	ND	0.88	3.19	"	39.9	ND		0-140			
Surrogate: Triphenyltin	39.2			"	39.9		98	65-132			
Surrogate: Tri-n-propyltin	1060			"	39.9		NR	65-140			S-02, S-04
Matrix Spike Dup (8120429-MSD1)		Source: 0812170-01			Prepared: 12/04/08		Analyzed: 12/12/08				
Tetrabutyltin	31.7	1.42	1.59	ug/kg dry	39.9	ND	79	74-115	13	30	
Tributyltin	185	1.58	1.59	"	39.9	ND	464	45-139	74	30	GC-60, QM-01
Dibutyltin	14.1	1.83	3.19	"	39.9	ND	35	0-165	14	30	
Monobutyltin	ND	0.88	3.19	"	39.9	ND		0-140		30	
Surrogate: Triphenyltin	32.1			"	39.9		81	65-132			
Surrogate: Tri-n-propyltin	1430			"	39.9		NR	65-140			S-02, S-04

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0812170

Notes and Definitions

S-04 The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

S-02 The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

R-07 The sample was diluted due to the presence of high levels of target analytes resulting in elevated reporting limits for this analyte.

QR-02 The RPD result exceeded the QC limits due to non-homogeneity of sample.

QM-4X The spike recovery was outside of the QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

QM-08 The spike recovery was outside of the QC limits due to noted non-homogeneity of the QC sample matrix.

QM-06 Due to noted non-homogeneity of the QC sample matrix, the MS/MSD did not provide reliable results for accuracy and precision. Sample results for the QC batch were accepted based on LCS/LCSD percent recoveries and RPD values.

QM-01 The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

QL-02 The RPD between the LCS and LCSD did not meet the acceptance criteria, however both have acceptable recoveries. Sample data not affected.

J Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

HT-03 This analysis was originally performed within the recommended EPA holding time. Data review determined that reanalysis was necessary.

GC-60 Unidentified peak co-elutes with reported peak causing interferences with the quantitation of this analyte.

GC-05 Results confirmed by GCMS.

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis (if indicated in units column)

RPD Relative Percent Difference

MDL Method detection limit (indicated per client's request)

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Pacific EcoRisk 0812170

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CHAIN-OF-CUSTODY RECORD

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS													
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534																	
Sampled By:		Drew Gantner																	
Phone:		(707) 207-7760																	
FAX:		(707) 207-7916																	
Project Manager:		Jeff Cotsifas																	
Project Name:		Levin-Richmond Terminal																	
PO Number:		14210																	
Client Sample ID		Sample Date	Sample Time	Sample Matrix*	Container		* See Analyte List	Grain Size Analysis											
					Number	Type													
1	LRT-S01-01	12/1/08	14:00	Sed	1	500ml glass	X												
2	LRT-S01-02	12/1/08	12:30	Sed	1	500ml glass	X												
3	LRT-S01-03	12/1/08	11:50	Sed	1	500ml glass	X												
4	LRT-S01-04	12/1/08	10:45	Sed	1	500ml glass	X												
5	LRT-S01-Z Layer Comp	12/1/08	10:45	Sed	1	500ml glass	X												
6	LRT-S01-01	12/1/08	14:00	Sed	1	poly bag		X											
7	LRT-S01-02	12/1/08	12:30	Sed	1	poly bag		X											
8	LRT-S01-03	12/1/08	11:50	Sed	1	poly bag		X											
9	LRT-S01-04	12/1/08	10:45	Sed	1	poly bag		X											
10	LRT-S01-Z Layer Comp	12/1/08	10:45	Sed	1	poly bag		X											
11																			
12																			
13																			
14																			
Correct Containers:		Yes	No	RELIQUISHED BY															
Sample Temperature:		Ambient	Cold	Warm	Signature: <i>[Signature]</i>				Signature:										
Sample Preservative:		Yes	No	Print: Mike McElroy				Print:											
Turnaround Time:		STD	Specify:	Organization: PER				Organization:											
Comments:						DATE: 12/3/08 TIME: 14:30				DATE:				TIME:					
Perform duplicate, MS/MSD, etc. on LRT-S01-01. Standard TAT.		RECEIVED BY																	
		Signature: <i>[Signature]</i>				Signature:													
		Print: Sean Flory				Print:													
		Organization:				Organization:													
		DATE: 12/4/08 TIME: 10:30				DATE:				TIME:									

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

T = 7° on blue ice

0812170

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: Pacific EcoRiskProject #: 14210Site #: Levin-Richmond TerminalSTANDARD LIST

Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Mercury	7471	X
Nickel	6020	X
Selenium	7742	X
Silver	6020	X
Zinc	6020	X
Organotins	Krone et al	X
TOC	Plumb 1981/ASTM	X
Grain Size	Plumb 1981/ASTM	X
Pesticides	8081A	X
PCBs	8082	X
PAHs	8270C-SIM	X
Total Solids	SMEWW 2540 B	X

ADDITIONAL TESTS

WET Metals (DI Water)	CAM*	
TRPH	418.2	
Sulfides, total	4500S	
Sulfides, dissolved	4500S-M	
Phthalates	8270	
Phenols	8270	
Ammonia	SM4500	

* Samples analyzed for metals listed above.

QA/QC

DMMO QA/QC, duplicate analysis, MS/MSD, etc. performed
on LRT-S01-01.

X

Standard TAT.

If you have any questions regarding this request as checked,
please call Jeff Cotsifas or Mike McElroy at (707) 207-7760.

(Rev. 12/01)



23 December 2008

Pacific Ecorisk
Attn: Jeff Cotsifas
2250 Cordelia Rd.
Fairfield, CA 94534

EMA Log #: 0812170

Project Name: Levin-Richmond Terminal

Enclosed with this letter are the test results performed by subcontract laboratory for the following analyses:

- Grain Size-ASTM

The samples were received by EnviroMatrix Analytical, Inc. intact and with chain-of-custody documentation. The test results and pertinent quality assurance/quality control data are listed on the attached tables.

I certify that this data report is in compliance both technically and for completeness. Release of the data contained in this hard copy data report has been authorized by the following signature.

Dan Verdon
Laboratory Director



WESTON SOLUTIONS, INC.
2433 Impala Drive
Carlsbad, CA 92010
(760) 795-6900 / (760) 931-1580 FAX
www.westonsolutions.com

December 22, 2008

Jamey A. Cote
EnviroMatrix Analytical, Inc.
4340 Viewridge Ave., Ste. A
San Diego, CA 92123

Dear Mr. Cote:

Please find enclosed the results for 5 grain size samples for your job EMA 0812170 received on December 5, 2008. These samples were processed according to procedures described by Plumb, 1981. All analyses were performed consistent with our laboratory's quality assurance program, and all samples met the quality control criteria specified in the above methods and/or our internal SOPs. This report is to be reproduced in its entirety.

We will dispose of the samples in 30 days unless you specify otherwise. Thank you for allowing us the opportunity of processing your sediment samples and please call if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Sheila Holt", is written over a horizontal line.

Sheila Holt
Project Manager

GRAIN SIZE ANALYSIS

Company: EnviroMatrix Analytical, Inc.
 Contract Number/Name: EMA 0812170
 Contact person: Jamey A. Cote
 Date of analysis: 12Dec08
 Date of report: 22Dec08
 Analysis method: Sieve/pipette (Plumb, 1981)
 Sample Identification: B081205.01
 Client Sample Name: 0812170-01
 Total sample weight: 26.320 grams

----- Size -----		Weight		Cumulative
Microns	Phi	grams	Percent	Percent
2000.000	-1.0	12.207	46.379	46.379
1414.214	-0.5	0.724	2.751	49.129
1000.000	0.0	0.402	1.527	50.657
707.107	0.5	0.361	1.372	52.028
500.000	1.0	0.369	1.402	53.430
353.553	1.5	0.536	2.036	55.467
250.000	2.0	0.270	1.026	56.493
176.777	2.5	0.413	1.569	58.062
125.000	3.0	0.563	2.139	60.201
88.388	3.5	0.592	2.249	62.450
62.500	4.0	0.567	2.154	64.604
31.250	5.0	0.874	3.322	67.926
15.625	6.0	1.124	4.271	72.197
7.812	7.0	1.207	4.588	76.785
3.906	8.0	1.041	3.955	80.740
1.953	9.0	0.999	3.797	84.536
< 1.953	> 9.0	4.070	15.464	100.000

% < 4 phi = 35.396
 % > 1 phi = 52.028
 % gravel = 46.379
 % sand = 18.226
 % silt = 16.135
 % clay = 19.260

Sample Statistics

Median	Mean	Dispersion	Skewness
phi microns	phi microns		
0 1161	*		

5th percentile = .
 16th percentile = .
 50th percentile = -0.215
 84th percentile = 8.859
 95th percentile = .
 *** 5th percentile not obtainable ***
 *** 16th percentile not obtainable ***
 *** 95th percentile not reached ***

Weston Solutions, Inc.
 2433 Impala Dr.
 Carlsbad, CA 92010

GRAIN SIZE ANALYSIS

Company: EnviroMatrix Analytical, Inc.
 Contract Number/Name: EMA 0812170
 Contact person: Jamey A. Cote
 Date of analysis: 12Dec08
 Date of report: 22Dec08
 Analysis method: Sieve/pipette (Plumb, 1981)
 Sample Identification: B081205.02
 Client Sample Name: 0812170-02
 Total sample weight: 27.543 grams

Size	Phi	Weight grams	Percent	Cumulative Percent
2000.000	-1.0	3.341	12.130	12.130
1414.214	-0.5	0.719	2.611	14.741
1000.000	0.0	0.651	2.364	17.104
707.107	0.5	0.549	1.993	19.098
500.000	1.0	0.533	1.935	21.033
353.553	1.5	0.695	2.523	23.556
250.000	2.0	0.921	3.344	26.900
176.777	2.5	1.080	3.921	30.821
125.000	3.0	1.984	7.203	38.025
88.388	3.5	2.768	10.050	48.075
62.500	4.0	2.737	9.937	58.012
31.250	5.0	3.081	11.187	69.198
15.625	6.0	1.624	5.896	75.094
7.812	7.0	1.416	5.140	80.234
3.906	8.0	1.041	3.779	84.013
1.953	9.0	0.958	3.477	87.490
< 1.953	> 9.0	3.446	12.510	100.000

% < 4 phi = 41.988
 % > 1 phi = 19.098
 % gravel = 12.130
 % sand = 45.882
 % silt = 26.001
 % clay = 15.987

Sample Statistics

Median	Mean	Dispersion	Skewness
phi microns	phi microns		
3.597 82.65	3.881 67.85	4.115	0.059

5th percentile =
 16th percentile = -0.234
 50th percentile = 3.597
 84th percentile = 7.997
 95th percentile =
 *** 5th percentile not obtainable ***
 *** 95th percentile not reached ***

Weston Solutions, Inc.
 2433 Impala Dr.
 Carlsbad, CA 92010

GRAIN SIZE ANALYSIS

Company: EnviroMatrix Analytical, Inc.
 Contract Number/Name: EMA 0812170
 Contact person: Jamey A. Cote
 Date of analysis: 12Dec08
 Date of report: 22Dec08
 Analysis method: Sieve/pipette (Plumb, 1981)
 Sample Identification: B081205.03
 Client Sample Name: 0812170-03
 Total sample weight: 25.612 grams

Size	Weight	Cumulative
Microns	Phi	Percent
2000.000	-1.0	29.748
1414.214	-0.5	34.370
1000.000	0.0	37.814
707.107	0.5	41.133
500.000	1.0	44.436
353.553	1.5	48.247
250.000	2.0	49.953
176.777	2.5	52.377
125.000	3.0	55.333
88.388	3.5	58.281
62.500	4.0	61.350
31.250	5.0	67.527
15.625	6.0	72.079
7.812	7.0	76.793
3.906	8.0	80.695
1.953	9.0	84.271
< 1.953	> 9.0	100.000

% < 4 phi = 38.650
 % > 1 phi = 41.133
 % gravel = 29.748
 % sand = 31.602
 % silt = 19.345
 % clay = 19.305

Sample Statistics

Median	Mean	Dispersion	Skewness
phi microns	phi microns		
2.010 248.32	3.219 107.42	5.706	0.212

5th percentile =
 16th percentile = -2.487
 50th percentile = 2.010
 84th percentile = 8.924
 95th percentile =
 *** 5th percentile not obtainable ***
 *** 16th percentile extrapolated ***
 *** 95th percentile not reached ***

Weston Solutions, Inc.
 2433 Impala Dr.
 Carlsbad, CA 92010

GRAIN SIZE ANALYSIS

Company: EnviroMatrix Analytical, Inc.
 Contract Number/Name: EMA 0812170
 Contact person: Jamey A. Cote
 Date of analysis: 12Dec08
 Date of report: 22Dec08
 Analysis method: Sieve/pipette (Plumb, 1981)
 Sample Identification: B081205.04
 Client Sample Name: 0812170-04
 Total sample weight: 21.900 grams

Size		Weight		Cumulative	
Microns	Phi	grams	Percent	Percent	
2000.000	-1.0	6.634	30.292	30.292	
1414.214	-0.5	0.584	2.667	32.959	
1000.000	0.0	0.497	2.269	35.228	
707.107	0.5	0.419	1.913	37.141	
500.000	1.0	0.372	1.699	38.840	
353.553	1.5	0.447	2.041	40.881	
250.000	2.0	0.599	2.735	43.616	
176.777	2.5	0.703	3.210	46.826	
125.000	3.0	0.550	2.511	49.338	
88.388	3.5	0.382	1.744	51.082	
62.500	4.0	0.356	1.626	52.707	
31.250	5.0	0.666	3.042	55.749	
15.625	6.0	0.708	3.232	58.981	
7.812	7.0	1.582	7.224	66.205	
3.906	8.0	1.041	4.753	70.959	
1.953	9.0	1.041	4.753	75.712	
< 1.953	> 9.0	5.319	24.288	100.000	

% < 4 phi = 47.293
 % > 1 phi = 37.141
 % gravel = 30.292
 % sand = 22.415
 % silt = 18.251
 % clay = 29.041

Sample Statistics

Median	Mean	Dispersion	Skewness
phi microns	phi microns		
3.190 109.58	*		

5th percentile =
 16th percentile =
 50th percentile = 3.190
 84th percentile = 10.873
 95th percentile =
 *** 5th percentile not obtainable ***
 *** 16th percentile not obtainable ***
 *** 84th percentile extrapolated ***
 *** 95th percentile not reached ***

Weston Solutions, Inc.
 2433 Impala Dr.
 Carlsbad, CA 92010

GRAIN SIZE ANALYSIS

Company: EnviroMatrix Analytical, Inc.
 Contract Number/Name: EMA 0812170
 Contact person: Jamey A. Cote
 Date of analysis: 18Dec08
 Date of report: 22Dec08
 Analysis method: Sieve/pipette (Plumb, 1981)
 Sample Identification: B081205.05
 Client Sample Name: 0812170-05
 Total sample weight: 29.364 grams

Size	Phi	Weight grams	Percent	Cumulative Percent
2000.000	-1.0	1.143	3.893	3.893
1414.214	-0.5	0.452	1.539	5.432
1000.000	0.0	0.394	1.342	6.774
707.107	0.5	0.326	1.110	7.884
500.000	1.0	0.286	0.974	8.858
353.553	1.5	0.383	1.304	10.162
250.000	2.0	0.227	0.773	10.935
176.777	2.5	0.451	1.536	12.471
125.000	3.0	0.980	3.337	15.808
88.388	3.5	1.534	5.224	21.033
62.500	4.0	1.839	6.263	27.295
31.250	5.0	4.788	16.306	43.601
15.625	6.0	4.413	15.030	58.631
7.812	7.0	3.248	11.060	69.691
3.906	8.0	1.999	6.806	76.497
1.953	9.0	1.665	5.672	82.169
< 1.953	> 9.0	5.236	17.831	100.000

% < 4 phi = 72.705
 % > 1 phi = 7.884
 % gravel = 3.893
 % sand = 23.403
 % silt = 49.202
 % clay = 23.503

Sample Statistics

Median	Mean	Dispersion	Skewness
phi microns	phi microns		
5.426 23.26	6.111 14.47	3.093	0.222

5th percentile = -0.640
 16th percentile = 3.018
 50th percentile = 5.426
 84th percentile = 9.203
 95th percentile =
 *** 84th percentile extrapolated ***
 *** 95th percentile not reached ***

Weston Solutions, Inc.
 2433 Impala Dr.
 Carlsbad, CA 92010

SUBCONTRACT ORDER

EnviroMatrix Analytical, Inc.

0812170

SENDING LABORATORY:

EnviroMatrix Analytical, Inc.
4340 Viewridge Ave., Ste. A
San Diego, CA 92123
Phone: (858) 560-7717
Fax: (858) 560-7763
Project Manager: Jamey A. Cote

RECEIVING LABORATORY:

MEC-Weston Solutions, Inc [S]
2433 Impala Drive
Carlsbad, CA 92009-1514
Phone :760-931-8081
Fax: 760-931-1580

STANDARD TAT

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 0812170-01	Sediment	Sampled:12/01/08 14:00		Run dup, MS/MSD on LRT-S01-01
Grain Size-ASTM	12/24/08 16:00	12/15/08 14:00		
Containers Supplied:				
Plastic Baggie (B)				
Sample ID: 0812170-02	Sediment	Sampled:12/01/08 12:30		Run dup, MS/MSD on LRT-S01-01
Grain Size-ASTM	12/24/08 16:00	12/15/08 12:30		
Containers Supplied:				
Plastic Baggie (B)				
Sample ID: 0812170-03	Sediment	Sampled:12/01/08 11:50		Run dup, MS/MSD on LRT-S01-01
Grain Size-ASTM	12/24/08 16:00	12/15/08 11:50		
Containers Supplied:				
Plastic Baggie (B)				
Sample ID: 0812170-04	Sediment	Sampled:12/01/08 10:45		Run dup, MS/MSD on LRT-S01-01
Grain Size-ASTM	12/24/08 16:00	12/15/08 10:45		
Containers Supplied:				
Plastic Baggie (B)				
Sample ID: 0812170-05	Sediment	Sampled:12/01/08 10:45		Run dup, MS/MSD on LRT-S01-01
Grain Size-ASTM	12/24/08 16:00	12/15/08 10:45		
Containers Supplied:				
Plastic Baggie (B)				

Send report to j.bayer@enviromatrixinc.com, H. Vick@enviromatrixinc.com, and reports@enviromatrixinc.com

Released By

Date

Received By

Date

Released By

Date

Received By

Date



Pacific EcoRisk 0812170

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

CHAIN-OF-CUSTODY RECORD

Client Name:		Pacific EcoRisk				REQUESTED ANALYSIS																
Client Address:		2250 Cordelia Rd. Fairfield, CA 94534				* See Analyte List	Grain Size Analysis															
Sampled By:		Drew Gantner																				
Phone:		(707) 207-7760																				
FAX:		(707) 207-7916																				
Project Manager:		Jeff Cotsifas																				
Project Name:		Levin-Richmond Terminal																				
PO Number:		14210																				
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container		Number	Type															
				Number	Type																	
1	LRT-S01-01	12/1/08	14:00	Sed	1	500ml glass	X															
2	LRT-S01-02	12/1/08	12:30	Sed	1	500ml glass	X															
3	LRT-S01-03	12/1/08	11:50	Sed	1	500ml glass	X															
4	LRT-S01-04	12/1/08	10:45	Sed	1	500ml glass	X															
5	LRT-S01-Z Layer Comp	12/1/08	10:45	Sed	1	500ml glass	X															
6	LRT-S01-01	12/1/08	14:00	Sed	1	poly bag		X														
7	LRT-S01-02	12/1/08	12:30	Sed	1	poly bag		X														
8	LRT-S01-03	12/1/08	11:50	Sed	1	poly bag		X														
9	LRT-S01-04	12/1/08	10:45	Sed	1	poly bag		X														
10	LRT-S01-Z Layer Comp	12/1/08	10:45	Sed	1	poly bag		X														
11																						
12																						
13																						
14																						

Correct Containers:	Yes	No		RELIQUISHED BY			
Sample Temperature:	Ambient	Cold	Warm	Signature:	<i>[Signature]</i>		Signature:
Sample Preservative:	Yes	No		Print:	Mike McElroy		Print:
Turnaround Time:	STD	Specify:		Organization:	PER		Organization:
Comments: Perform duplicate, MS/MSD, etc. on LRT-S01-01. Standard TAT.				DATE:	12/3/08	TIME:	14:30
				RECEIVED BY			
				Signature:	<i>[Signature]</i>		Signature:
				Print:	Sean Flory		Print:
				Organization:			Organization:
				DATE:	12/4/08	TIME:	10:30
				DATE:			TIME:

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)

T = 7° on blue ice

0812170

ANALYTE LIST

Pacific EcoRisk
2250 Cordelia Rd.
Fairfield, CA 94534

Project Proponent: Pacific EcoRiskProject #: 14210Site #: Levin-Richmond TerminalSTANDARD LIST

Arsenic	6020	X
Cadmium	6020	X
Chromium	6020	X
Copper	6020	X
Lead	6020	X
Mercury	7471	X
Nickel	6020	X
Selenium	7742	X
Silver	6020	X
Zinc	6020	X
Organotins	Krone et al	X
TOC	Plumb 1981/ASTM	X
Grain Size	Plumb 1981/ASTM	X
Pesticides	8081A	X
PCBs	8082	X
PAHs	8270C-SIM	X
Total Solids	SMEWW 2540 B	X

ADDITIONAL TESTS

WET Metals (DI Water)	CAM*
TRPH	418.2
Sulfides, total	4500S
Sulfides, dissolved	4500S-M
Phthalates	8270
Phenols	8270
Ammonia	SM4500

* Samples analyzed for metals listed above.

QA/QC

DMMO QA/QC, duplicate analysis, MS/MSD, etc. performed
on LRT-S01-01.

Standard TAT.

If you have any questions regarding this request as checked,
please call Jeff Cotsifas or Mike McElroy at (707) 207-7760.

X

(Rev. 12/01)

Appendix C

Analytical Chemistry Laboratory Data Report Submitted by EnviroMatrix, Inc. Analysis of Archive Sediment Sample LRTC-S01-03



16 January 2009

Pacific Ecorisk
Attn: Jeff Cotsifas
2250 Cordelia Road
Fairfield, California 94534

EMA Log #: 0901172

Project Name: Levin-Richmond Terminal

Enclosed are the results of analyses for samples received by the laboratory on 01/09/09 09:28. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that this data is in compliance both technically and for completeness.

Dan Verdon
Laboratory Director

CA ELAP Certification #: 2564

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
LRT-S01-03	0901172-01	Sediment	12/01/08 11:50	01/09/09 09:28

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

Polychlorinated Biphenyls by EPA Method 8082

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-03 (0901172-01) Sediment Sampled: 12/01/08 11:50 Received: 01/09/09 09:28										HT-04
Aroclor 1016	ND	17.9	76.6	ug/kg dry	10	9011206	01/12/09	01/14/09	EPA 8082	
Aroclor 1221	ND	17.9	76.6	"	"	"	"	"	"	
Aroclor 1232	ND	17.9	76.6	"	"	"	"	"	"	
Aroclor 1242	ND	17.9	76.6	"	"	"	"	"	"	
Aroclor 1248	ND	17.9	76.6	"	"	"	"	"	"	
Aroclor 1254	249	17.9	76.6	"	"	"	"	"	"	
Aroclor 1260	ND	17.9	76.6	"	"	"	"	"	"	
Total Aroclors	249	17.9	76.6	"	"	"	"	"	"	
Surrogate: TCMX		47 %	26-146			"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

Conventional Chemistry Parameters by Standard/EPA Methods

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
LRT-S01-03 (0901172-01) Sediment Sampled: 12/01/08 11:50 Received: 01/09/09 09:28										
% Solids	52.2	0.1	0.1	%	1	9010935	01/09/09	01/12/09	SM 2540 G	HT-05

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9011206											
Blank (9011206-BLK1)											
						Prepared: 01/12/09 Analyzed: 01/14/09					
Aroclor 1016	ND	0.94	4.00	ug/kg wet							
Aroclor 1221	ND	0.94	4.00	"							
Aroclor 1232	ND	0.94	4.00	"							
Aroclor 1242	ND	0.94	4.00	"							
Aroclor 1248	ND	0.94	4.00	"							
Aroclor 1254	ND	0.94	4.00	"							
Aroclor 1260	ND	0.94	4.00	"							
Total Aroclors	ND	0.94	4.00	"							
Surrogate: TCMX	4.84			"	6.67		73	26-146			
LCS (9011206-BS1)											
						Prepared: 01/12/09 Analyzed: 01/14/09					
Aroclor 1260	154	2.34	10.0	ug/kg wet	167		92	8-127			
Surrogate: TCMX	14.2			"	16.7		85	26-146			
LCS Dup (9011206-BSD1)											
						Prepared: 01/12/09 Analyzed: 01/14/09					
Aroclor 1260	156	2.34	10.0	ug/kg wet	167		94	8-127	1	30	
Surrogate: TCMX	13.9			"	16.7		83	26-146			
Duplicate (9011206-DUP1)											
						Source: 0901172-01 Prepared: 01/12/09 Analyzed: 01/14/09					
Aroclor 1016	ND	17.9	76.6	ug/kg dry		ND				30	
Aroclor 1221	ND	17.9	76.6	"		ND				30	
Aroclor 1232	ND	17.9	76.6	"		ND				30	
Aroclor 1242	ND	17.9	76.6	"		ND				30	
Aroclor 1248	ND	17.9	76.6	"		ND				30	
Aroclor 1254	203	17.9	76.6	"		249			20	30	
Aroclor 1260	ND	17.9	76.6	"		ND				30	
Total Aroclors	203	17.9	76.6	"		249			20	30	
Surrogate: TCMX	8.30			"	12.8		65	26-146			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 9011206											
Duplicate (9011206-DUP2)			Source: 0812170-03RE2		Prepared: 01/12/09		Analyzed: 01/14/09				
Aroclor 1016	ND	9.36	40.0	ug/kg wet		ND				30	
Aroclor 1221	ND	9.36	40.0	"		ND				30	
Aroclor 1232	ND	9.36	40.0	"		ND				30	
Aroclor 1242	ND	9.36	40.0	"		ND				30	
Aroclor 1248	ND	9.36	40.0	"		ND				30	
Aroclor 1254	193	9.36	40.0	"		256			28	30	
Aroclor 1260	ND	9.36	40.0	"		ND				30	
Total Aroclors	193	9.36	40.0	"		256			28	30	
Surrogate: TCMX	5.10			"	6.67		76	26-146			
Matrix Spike (9011206-MS1)			Source: 0901172-01		Prepared: 01/12/09		Analyzed: 01/14/09				
Aroclor 1260	389	22.4	95.8	ug/kg dry	319	ND	122	8-127			
Surrogate: TCMX	32.3			"	31.9		101	26-146			
Matrix Spike Dup (9011206-MSD1)			Source: 0901172-01		Prepared: 01/12/09		Analyzed: 01/14/09				
Aroclor 1260	314	22.4	95.8	ug/kg dry	319	ND	98	8-127	21	30	
Surrogate: TCMX	32.9			"	31.9		103	26-146			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

Conventional Chemistry Parameters by Standard/EPA Methods - Quality Control

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----	--------------------	-------	----------------	------------------	----------------	-----	--------------	-------

Batch 9010935

Duplicate (9010935-DUP1)

Source: 0901103-06

Prepared: 01/09/09 Analyzed: 01/12/09

% Solids	16.0	0.1	0.1	%		15.9		0.6	20	
----------	------	-----	-----	---	--	------	--	-----	----	--

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Client Name: Pacific Ecorisk
Project Name: Levin-Richmond Terminal

EMA Log #: 0901172

Notes and Definitions

HT-05 This sample was received outside of the method recommended holding time for this analysis.

HT-04 This sample was received outside of the EPA recommended holding time for this analysis.

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

dry Sample results reported on a dry weight basis (if indicated in units column)

RPD Relative Percent Difference

MDL Method detection limit (indicated per client's request)

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





Pacific EcoRisk

ENVIRONMENTAL CONSULTING & TESTING

2250 Cordelia Rd., Fairfield, CA 94534

(707)207-7760

Enviromatrix CHAIN-OF-CUSTODY RECORD

Client Name: Pacific EcoRisk		REQUESTED ANALYSIS																																																																																													
Client Address: 2250 Cordelia Rd. Fairfield, CA 94534		<div style="display: flex; align-items: center; justify-content: center;"><div style="writing-mode: vertical-rl; transform: rotate(180deg);">Aroclors</div><table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table></div>																																																																																													
Sampled By: PER																																																																																															
Phone: (707) 207-7760																																																																																															
FAX: (707) 207-7916																																																																																															
Project Manager: Jeff Cotsifas																																																																																															
Project Name: LRT																																																																																															
PO Number: 14210																																																																																															
Client Sample ID	Sample Date	Sample Time	Sample Matrix*	Container																																																																																											
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Sample Preservative:		Yes	No		Print: Mike McElroy		Print:																																																																																								
Turnaround Time:		STD	Specify:		Organization: PER		Organization:																																																																																								
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				DATE: 1-9-08		TIME: 9:28		DATE:				TIME:																																																																																			

*MATRIX CODES: (SED = Sediment); (FW = Freshwater); (WW = Wastewater); (STRMW = Stormwater)